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Public Health Laboratory Service

1969
YEAR BOOK

including Annual Report for 1968

RBA/66(g)

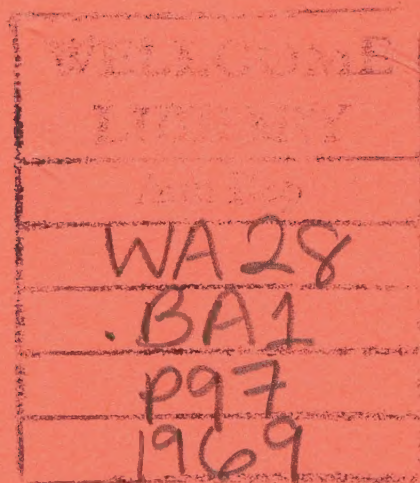
ROYAL SOCIETY

FOR THE PROMOTION

HEALTH

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CONTENTS

	PAGE
THE PUBLIC HEALTH LABORATORY SERVICE BOARD	ii
MEMBERS OF THE BOARD.. .. .	iii
HEADQUARTERS ADMINISTRATIVE OFFICE	v
INTRODUCTION	
Administration and Organisation of the Service	1
Scope of the Service	2
Grants and other assistance received for special investigations in 1968	4
REVIEW BY THE DIRECTOR OF THE SERVICE OF ACTIVITIES IN 1968	7
DISTRIBUTION OF PUBLIC HEALTH LABORATORIES IN ENGLAND AND WALES—MAP	24
DIRECTORY OF THE SERVICE	
Headquarters Administrative Office	25
Central Public Health Laboratory	25
Constituent Laboratories { Regional Laboratories	26
Area Laboratories.. .. .	27
Reference Laboratories	33
Special Laboratories	34
Staff in training	35
Staff seconded to other institutions	35
Hospital Pathological Laboratories—designated “Recognised”— at which arrangements are made for the examination of public health specimens for the Service	36
Consultant Bacteriologists employed by Regional Hospital Boards in the Hospital Service, who are associated on a part-time basis with the Public Health Laboratory Service	36
Reference Experts.. .. .	37
Vaccines and Sera obtainable through the Service	44
APPENDIX I—Principal Committees and Working Parties	47
APPENDIX II—List of Publications during 1968	53
APPENDIX III—Awards and External Offices accepted by members of the Service during 1968	63
INDEX TO PERSONAL NAMES	65

THE PUBLIC HEALTH LABORATORY SERVICE BOARD

Mr. J. R. McGregor retired from the Board on 31st July, 1969, and has been succeeded by Mr. R. C. Bryant, late Under-Secretary of the Board of Trade. In addition, Dr. A. J. Essex-Cater, Medical Officer of Health for Monmouthshire, has been appointed to the Board.

The present membership of the Board is set out on page iii.

SIR JAMES HOWIE

The conferment by Her Majesty of a Knighthood on the Director has given very great pleasure to everyone in the Service and on the Board, and to Sir James Howie's innumerable friends throughout the world.

This honour indicates the great debt of gratitude that the country owes to Sir James on very many different and well known counts. May he and Lady Howie long enjoy it.

THE PUBLIC HEALTH LABORATORY SERVICE BOARD

Chairman: E. T. C. Spooner, C.M.G., M.D., F.R.C.P.

(Dean, London School of Hygiene and Tropical Medicine,
London, W.C.1)

Members: F. A. Adams, C.B.

(late Under-Secretary for Finance and Accountant General,
Ministry of Health)

R. C. Bryant, C.B.

(late Under-Secretary, Board of Trade)

Professor A. C. Cunliffe, M.D., F.C.Path.

(Professor of Bacteriology, University of London, at King's
College Hospital Medical School, London, S.E.5)

J. B. Meredith Davies, M.D., D.P.H.

(Deputy Medical Officer of Health, City of Liverpool)

A. A. Driver, M.D., D.P.H.

(Senior Administrative Medical Officer, Leeds Regional Hospital
Board)

A. J. Essex-Cater, M.R.C.S., D.C.H., D.P.H., D.I.H., F.R.A.I.

(Medical Officer of Health, Monmouthshire County Council)

Professor R. Knox, M.D., F.R.C.P.

(Professor of Bacteriology, University of London, at Guy's
Hospital Medical School)

Professor K. McCarthy, M.D., M.C.Path.

(Professor of Bacteriology, University of Liverpool)

R. M. Shaw, C.B., M.B., D.P.H.

(Deputy Chief Medical Officer, Ministry of Health)

Charles C. Stevens, LL.B.

(Member of Manchester Regional Hospital Board; Chairman,
Macclesfield and District Hospital Management Committee)

J. F. Warin, M.D., D.P.H.

(Medical Officer of Health, Oxford)

G. I. Watson, O.B.E., M.D., D.T.M. & H.

(Medical Practitioner, Peaslake, Surrey)

Professor N. P. L. Wildy, M.B., M.R.C.S., F.R.S.E.

(Professor of Virology and Bacteriology, University of
Birmingham)

Staff Assessors to the Board:

B. Moore, M.D., B.Sc., F.C.Path., B.A.O.

M. T. Parker, M.D., F.C.Path., Dip.Bact.

Secretary:

J. D. Whittaker, M.B.E.

PUBLIC HEALTH LABORATORY SERVICE YEAR BOOK 1969

CHANGES OF ADDRESS

page 27

BIRMINGHAM:

Public Health Laboratory, East
Birmingham Hospital, Bordesley
Green East, Birmingham, 9.
Tel.: Birmingham. Victoria
(STD 021-772) 4311, Ext.680

page 30

MIDDLESBROUGH:

Middlesbrough is now part of the County Borough of Teesside,
and in future will be listed under TEESSIDE.
The address should be shown as follows:

TEESSIDE

Public Health Laboratory, General
Hospital, Ayresome Green Lane,
Middlesbrough, Teesside.
Tel.: Middlesbrough (STD 0642)
87766

HEADQUARTERS ADMINISTRATIVE OFFICE

24 Park Crescent, London, W1N 4DA

Tel.: Museum (STD 01-636) 2223

Sir James Howie, LL.D., M.D., F.R.C.P., F.C.Path. (*Director of the Service*)

J. C. Kelsey, M.D., F.C.Path., Dip.Bact. (*Deputy Director of the Service:*
see also pages 25 and 33)

J. D. Whittaker, M.B.E. (*Secretary of the Board*)

R. H. Westlake (*Finance Officer and Deputy Secretary of the Board*)

J. W. Bushell (*Establishments Officer*)

R. V. Jackson (*Accountant and Supplies Officer*)

*A. Waltho (*Officer in Charge*), MRC Central Store, Colindale Avenue,
London, N.W.9. *Tel.: Colindale (STD 01-205) 0071*

* Member of the staff of the Medical Research Council.

INTRODUCTION

ADMINISTRATION AND ORGANISATION OF THE SERVICE

The Public Health Laboratory Service is the successor of the Emergency Public Health Laboratory Service planned, organised and administered during the war years 1939–1945 by the Medical Research Council, at the request of H.M. Government. In 1945 it was decided by the Government to retain the Service on a permanent footing. Statutory authority was provided by Section 17 of the National Health Service Act, 1946, which empowered the Minister of Health to provide a “bacteriological service” for the control of the spread of infectious diseases. Later the Medical Research Council agreed to an extension of the period of their administration, with the delegation of detailed responsibility to the Public Health Laboratory Service Board appointed by them for this purpose. In 1960, however, the Public Health Laboratory Service Act, 1960, established and incorporated a new Public Health Laboratory Service Board as a statutory body capable of acting in its own right as agent for the Minister. The Act also provided for the transfer of staff of the Service from the employment of the Council to that of the Board, and the transfer of property from the Council to the Minister of Health; these transfers took effect on 1st August, 1961.

The Chairman and members of the Public Health Laboratory Service Board are appointed by the Secretary of State for Social Services and, in accordance with the Schedule to the Act, the members must include the following (and must therefore be at least eight in number, in addition to the Chairman):

- (a) not less than two persons appointed after consultation with the Medical Research Council;
- (b) not less than two persons with experience as bacteriologists, appointed after consultation with such organisations as the Secretary of State thinks appropriate;
- (c) not less than two persons holding office as medical officer of health to a local authority;
- (d) not less than one person appointed after consultation with such organisations as appear to the Secretary of State to represent the hospital service;
- (e) not less than one fully registered medical practitioner engaged in general medical practice, appointed after consultation with such organisations as the Secretary of State may recognise as representative of practitioners so engaged.

The Chairman and members of the Board are normally appointed for a term of three years.

The Board exercises its functions in accordance with any directions received from the Secretary of State for Social Services. In the exercise of these functions it acts as a principal.

The staff of the laboratories of the Service are appointed and employed by the Board. The directors of the constituent laboratories are whole-time medically qualified bacteriologists, with full consultant status. Professional staff are selected to a large extent from newly qualified medical graduates after they have held house appointments for 12 months or longer, they then receive five years' training in pathology and bacteriology. During the third year the trainee is required to obtain the Diploma in Bacteriology of the University of London or of the University of Manchester. The Service also receives fully trained recruits from the Hospital Service and from the universities. As a general rule, science graduates without medical qualifications are employed only in the reference laboratories (*see* page 33) where the work is of a highly specialised nature.

The technical staff of registered medical laboratory technicians are recruited from boys and girls leaving school at 16 to 17 years of age, who have attained the necessary standard of education; they go through a system of training in academic and practical subjects now becoming general in pathological laboratories throughout the country.

The development of the Service between 1946—in which year it was established in its present form—and 1968 may be summarised as follows:

	1948	1955	1962	1968
Number of Constituent				
Laboratories	36	56	59	62
Medical staff	84	{ 124	132	150
Scientific staff			39	62
Technical, Clerical and				
Maintenance staff ..	562	778	956	1,175
Total specimens examined ..	793,314	1,689,033	2,314,126	3,310,000

SCOPE OF THE SERVICE

The Public Health Laboratory Service is designed to make the laboratory investigations needed to provide a continuous picture of the communicable microbial diseases of England and Wales. These diseases must be accurately defined by identifying the agents that cause them, by continuously seeking out and recording their whereabouts, and by investigating what really matters in promoting or limiting their spread. The activities of the P.H.L.S. allow useful advice to be offered to the central and local health authorities, and to others concerned with the control and prevention of these diseases.

The Service at present consists of 9 Regional Laboratories (*see* page 26), 54 Area Laboratories (*see* page 27), and 17 Reference and Special Laboratories (*see* page 33), most of the latter being grouped as the Central Public Health Laboratory at Colindale, London, N.W.9. Almost all the Regional and Area Laboratories are situated in hospitals, and in addition to their specifically public health functions act as the microbiological component of a group laboratory undertaking clinical work for the hospital staff and for local general practitioners. Public health work is undertaken for medical officers of health over a wider

area. In certain places where there is not a Public Health Laboratory, arrangements are made for this work to be done by a hospital bacteriologist acting for the Public Health Laboratory Service. Personal consultation between clinicians and the medical staff of local health authorities are welcomed. Members of the laboratory staff are prepared to investigate outbreaks of communicable disease in the field if asked to do so.

In certain circumstances Public Health Laboratories receive specimens from general practitioners outside the normal clinical area of the group laboratory; for example, specimens of public health interest requested by the medical officer of health, or specimens needed as part of one of the nationwide surveys which form a major activity of the Service. The Reference and Special Laboratories normally receive specimens only from other laboratories.

All specimens must be submitted by doctors, veterinarians, dentists, public health inspectors, and others acting on behalf of medical officers of health, Government departments, or representatives of other official bodies; specimens cannot be accepted from private persons (see, however, sub-paragraph (b) below).

The routine specimens fall under two main heads:

- (a) “ Clinical ” specimens received from hospitals, general practitioners and local health authorities. These are specimens of sputum, faeces, throat swabs, blood samples, etc., taken from persons suspected of suffering from (or being capable of transmitting) a microbial disease.
- (b) “ Sanitary ” specimens: these are received from medical officers of health, public health inspectors, and others concerned officially with the control of the public health. They comprise specimens for bacteriological examination of water, shell-fish, watercress, sewage, milk and cream; of processed foods such as ice-cream, artificial cream and canned foods; and of imported products such as the various forms of meat, fish, processed egg, coconut and fertiliser. The Service normally examines only material offered to the consumer, but will, of course, examine specimens taken at any stage of production or distribution by medical officers of health investigating suspected food-borne infections. The Service is ready to give free advice to food manufacturers and processors to assist them in the production and distribution of bacteriologically safe products. For routine control of such products, commercial firms are charged a fee, but work of this sort is undertaken only exceptionally.

The epidemiological work of the Service includes not only the investigation of outbreaks of infectious disease, in co-operation with local medical officers of health, but also studies of the distribution and behaviour of infectious agents throughout England and Wales, and of the various aspects of the immunisation programme. Epidemiological information is collected centrally week by week from public health and hospital laboratories all over the country, including Scotland, Northern Ireland and Eire and then made available to each of these laboratories in turn in the form of a confidential weekly “ Communicable Diseases Report ”.

Field investigations of infectious disease, and field trials of protective agents, including vaccines, are frequently carried out. All laboratories are engaged to some extent in research in addition to routine work.

A special feature of the Service is the investigation of various problems by Working Parties containing a dozen or more members drawn from laboratories in different parts of the country. Some of the problems investigated are of direct concern to Government Departments, with which close working relations have always existed.

Brief mention has already been made of the reference laboratories and specialist departments. These provide facilities for the exact identification and "finger-printing" of organisms belonging to many different groups. This is sometimes required by clinicians in their treatment of patients, but more often for epidemiological purposes. The reference laboratories are freely available for consultation by any laboratory within or without the Service. In addition, a number of reference experts are retained for the examination of occasional specimens which require special skill, special knowledge, or special reagents.

The Service distributes various vaccines and sera on behalf of the Department of Health and Social Security. It also provides certain reagents for diagnostic purposes, prepared by or issued from the Standards Laboratory for Serological Reagents at the Central Public Health Laboratory, Colindale Avenue, London, N.W.9 (*see* page 35).

Directors of Public Health Laboratories are always prepared to discuss the facilities they can offer, either directly or through other units of the Service, and how these facilities may best be used.

GRANTS AND OTHER ASSISTANCE RECEIVED FOR SPECIAL INVESTIGATIONS IN 1968

The Public Health Laboratory Service Board now receive valuable assistance from the Departmental Research and Development Fund of the Ministry of Health. Allocations from this fund have enabled the Board to undertake the following important projects, involving research work of an "operational" nature:

A study of the use of a computer for the identification of bacteria.

The establishment of a special laboratory for the study and typing of mycoplasmas—this being a necessary preliminary step towards the provision by the Service of reference facilities for these organisms.

Laboratory investigations into farmers' lung.

Research into rubella and the use of gamma globulin.

An investigation of laminar flow ventilation and the determination of its effectiveness in protecting hospital patients who are at special risk to cross-infection.

Research on infectious hepatitis. The purchase of marmosets to be used in the investigation.

Research on non-bacterial enteritis

The establishment of reference facilities for monitoring transferable drug resistance.

The surveillance of whooping cough and B.C.G. vaccines.

The Board also receive grants from the following bodies for the assistance of special investigations and the acquisition of major equipment of a special nature:

(a) From the World Health Organisation:

\$3,500 for the assistance of laboratory research on enteric phage-typing at the International Centre recognised at the Enteric Reference Laboratory, Colindale, London.

\$3,500 for the International Shigella Centre recognised at the Dysentery Reference Laboratory, Colindale, London.

\$3,000 for the International Reference Centre for Staphylococcal Phage-typing recognised at the Cross-Infection Reference Laboratory, Colindale, London.

\$2,500 towards the cost of testing the specificity of virus antisera at the Standards Laboratory for Serological Reagents, Colindale, London.

\$2,500 for the preparation and testing of reagents (rhinovirus), at the Virus Reference Laboratory, Colindale, London.

\$4,000 towards the cost of epidemiological serological investigations of tropical sera for antibodies in treponematoses at the Venereal Diseases Reference Laboratory, London Hospital Research Laboratories, London.

(b) From the Medical Research Council:

A grant of £11,698 a year for two years for a second survey into the pattern of infection in acute respiratory virus diseases, £3,370 a year being for a study in collaboration with general practitioners and £8,328 a year for a study in association with the Council of children in hospital.

Grants are held by the following individual members of the Board's staff:

(a) From the Medical Research Council:

Dr. I. G. Murray (Director, Mycological Reference Laboratory, London School of Hygiene and Tropical Medicine).

Provision for research in serological methods in the classification of pathogenic fungi and in the diagnosis of mycoses.

Dr. P. G. Higgins (Virologist, Epidemiological Research Unit, Cirencester).

Provision for research into the application of organ cultures to the diagnosis and epidemiology of virus infections in the general community.

Dr. S. P. Lapage (Curator, National Collection of Type Cultures, Colindale, London).

Provision for research in the analysis of genetic material of the bacterial cell.

Dr. J. O'H. Tobin (Director, Public Health Laboratory, Manchester).

Provision for research on cytomegalovirus infections.

Dr. R. Blowers (Director, Public Health Laboratory, Middlesbrough).

Provision for research on biochemical factors controlling nose and skin carriage of staphylococcus aureus.

Dr. R. W. S. Harvey (Consultant Bacteriologist, Public Health Laboratory, Cardiff).

Provision for the purchase of special equipment for studies on the initiation and sources of salmonellosis in man in South Wales.

Dr. J. O'H. Tobin (Director, Public Health Laboratory, Manchester).

Provision for research into rubella vaccination in " post-partum " women.

(b) From the Wellcome Trust:

Dr. Betty C. Hobbs (Director, Food Hygiene Laboratory).

Provision for research on enterotoxin produced by some heat resistant strains of Staphylococcus in certain foodstuffs.

In addition to the provision of research grants described above, two research projects are in progress jointly with the Medical Research Council, in which members of the Council's scientific staff are collaborating. These are as follows:

Research work on viruses at the Epidemiological Research Unit, Cirencester, Gloucestershire;

Various studies at the Cross-Infection Reference Laboratory, Colindale Avenue, London, N.W.9.

Laboratory Directors of the Service are also carrying out investigations in conjunction with general practitioners and hospital medical officers in many places, notably in the study of chronic bronchitis, of hospital cross-infection, and of sterilisation and disinfection problems; on gastro-enteritis and the safety of various foods.

A clause of the Schedule of the Public Health Laboratory Service Act, 1960 permits the Board to accept, hold and administer private gifts on trust for any purpose related to the Public Health Laboratory Service or otherwise connected with bacteriological research.

REVIEW BY THE DIRECTOR OF THE SERVICE OF ACTIVITIES IN 1968

LABORATORIES

The Laboratory at the Central Middlesex Hospital was opened in January 1968.

RETIREMENTS AND RESIGNATIONS

Dr. J. A. N. Emslie, Deputy Director at Middlesbrough and Acting Director since August 1967, resigned on 31st October, 1968, to take a Consultant Bacteriologist post with the Western Regional Hospital Board.

Dr. W. L. Hooper, Director of the Stafford Laboratory since February 1966, resigned on 31st December 1968 to take up the post of Consultant Bacteriologist to the Bournemouth and East Dorset Group of Hospitals.

Dr. C. H. Jellard, Director of the Plymouth Laboratory since July 1954, resigned on 31st March, 1968, to take up a post in Canada.

APPOINTMENTS

Dr. Joan R. Davies was appointed Director of the Public Health Laboratory at County Hall as from 1st February, 1968, following the death of Dr. A. J. H. Tomlinson in November 1967.

Mr. W. B. Fletcher was appointed Records Officer at the Central Public Health Laboratory from 5th June, 1968.

Dr. Elizabeth I. Tanner was promoted to Consultant Bacteriologist, Deputy Director of the Epsom Laboratory from 1st February, 1968.

Dr. C. E. D. Taylor was appointed Director of the new Public Health Laboratory at the Central Middlesex Hospital.

Dr. B. T. Thom was appointed from 1st April, 1968, as the Director of the new Public Health Laboratory to be at Whipps Cross Hospital.

Dr. J. G. Wallace, Director of the Northallerton Laboratory, became Acting Director of the Middlesbrough Laboratory from 1st November, 1968.

Mr. J. D. Whittaker, M.B.E., was appointed Secretary to the P.H.L.S. Board from 1st April, 1968, upon the retirement of Mr. D. V. T. Fairrie (see note on page 21).

LOCUMS

We are most grateful to the following for help with locum duties:
Dr. R. Norton at Ipswich, Plymouth, and Sunderland; and Dr. Bessie E. Cadness Graves at Watford.

SECONDMENTS ABROAD

Dr. R. Blowers continued his secondment to Makerere University College, Uganda, where he held a temporary appointment to the Chair of Microbiology. Dr. C. S. Goodwin also continued his secondment to the Ethiopian Leprosy Mission. Dr. D. C. J. Bassett returned from Trinidad and took up a post as Senior Bacteriologist at the Cross-Infection Reference Laboratory in November 1968.

VISITS ABROAD

Dr. E. S. Anderson accepted an invitation of the Ecological Research Committee of the Swedish Natural Science Research Council to speak at a symposium in Stockholm on "The Use of Antibiotics—an Ecological Problem". He also visited Lausanne, Switzerland, to give lectures on "Transferable Drug Resistance" by invitation of the Department of Microbiology, University of Lausanne.

Dr. B. E. Andrews, Dr. D. M. Jones and Dr. R. H. Leach attended the International Symposium on Mycoplasma Diseases of Man in Erfurt, Germany, and Dr. Jones gave a paper on "Mycoplasma Infections of the Genital Tract". Dr. Andrews and Mr. W. R. Maxted, F.I.M.L.T., made a short visit to Paris to discuss L-forms at the Pasteur Institute.

Dr. C. M. Patricia Bradstreet, Miss Anne M. Field, Ph.D., Dr. L. Hoyle and Dr. J. O'H. Tobin attended the First International Congress for Virology in Helsinki, Finland.

Dr. K. Patricia Carpenter went to Dacca, East Pakistan, to discuss the work of the Pakistan-SEATO Cholera Research Laboratory, and to compare methods for isolating and identifying cholera vibrios.

Dr. J. E. Cradock-Watson gave a paper at the XIIth Symposium of the European Association against Poliomyelitis and Allied Diseases, held in Bucharest, Rumania. Dr. D. Reid attended the same Symposium.

Dr. D. G. Fleck visited Geneva, Switzerland, to study methods developed by Dr. Engelbrecht for work on toxoplasmosis, using the fluorescent antibody test.

Dr. A. L. Furniss accepted an invitation to visit the Cholera Research Laboratory in Dacca, East Pakistan, to assess the details of the bacteriological laboratory situation. He produced a detailed plan for reorganizing the accommodation, equipment, and work; and he will continue to supervise its implementation by making short visits as required. Sir James Howie continued his connection with the Dacca Laboratory by attending a meeting of the Technical Committee in Dacca as United Kingdom representative from 4th to 12th December, 1968.

Dr. J. H. Hale went to Boston, U.S.A., to attend a joint meeting between the Royal College of Physicians of London and the American College of Physicians.

Dr. Elizabeth Hall Asheshov went to Budapest in Hungary to study methods developed by Dr. Lanyi and Dr. Milch for typing *Proteus* serologically, and phage-typing for *Klebsiella*.

Mr. L. R. Hill, M.Sc., accepted an invitation of the University of Parma to give a three-day course of lectures on Numerical Taxonomy at Parma, Italy.

Dr. Betty C. Hobbs contributed a paper on “*Clostridium welchii* Food Poisoning” at a meeting of the Societe Francaise de Microbiologie, in Lille, France. She also attended a meeting in Brussels, Belgium organised by Dr. E. H. Kampelmacher in connection with inter-laboratory testing for meat examination in European countries. Dr. Hobbs accepted the invitation of the International Association of Microbiological Societies to attend a meeting in Bilthoven, Holland, of the Organising Committee of the 6th Symposium on “The Microbiology of Dehydrated Foods”, and to give a paper on “The Detection of *Clostridium perfringens* in Dried Foods”. She also gave a paper on “Food Poisoning due to Clostridia” at an International Congress in Teheran, Iran, organised by the Food Hygiene and Technology Department of the Teheran Veterinary College.

Dr. W. L. Hooper attended the International Health Congress in Copenhagen, Denmark, at which international food standards and the control of imported foodstuffs were discussed.

Dr. L. Hoyle and Sir James Howie attended a joint meeting of the Pathological Society and the Netherlands Pathological Society in Leiden, Holland.

Dr. J. G. P. Hutchison visited Rhodesia to undertake certain responsibilities on behalf of the University of Birmingham in connection with the teaching of bacteriology at the new Medical School in Salisbury.

Dr. W. H. H. Jebb made two short visits to Copenhagen by invitation of the Director of the Regional Office for Europe of the World Health Organisation in connection with the revision of European Standards for Drinking Water.

Dr. S. P. Lapage visited Tokyo in Japan to attend the First World Conference on Culture Collections, sponsored by UNESCO.

Mr. G. V. Laubersheimer, F.I.M.L.T., visited Leiden in Holland to study the immunofluorescence technique for rapid diagnosis of influenza developed by Dr. Hers.

Dr. A. D. Macrae went to Washington, U.S.A., to study recent developments in virus laboratories in America with a World Health Organization Fellowship.

Dr. D. L. Miller attended the Second *ad hoc* Working Group on Communicable Diseases organised by the Central Treaty Organisation Economic Committee—Sub-Committee on Health, in Ankara, Turkey.

Dr. I. G. Murray gave a paper on “Immunity in Mycetoma” in Strasbourg, France, by invitation of the French Societe de Mycologie Medicale. He also attended Congresses in Teheran as an official delegate of the London School of Hygiene and Tropical Medicine.

Dr. D. J. H. Payne visited centres in Copenhagen, Stockholm, and Holland to discuss problems of cross-infection, on behalf of the Wessex Regional Hospital Board.

Dr. T. M. Pollock gave a paper on epidemiology at the Annual Meeting of the Anglo-German Medical Society in Kiel, Germany. He also presented a paper on the prevention of influenza by vaccination, at the International Congress of Hygiene and Preventive Medicine in Rome, Italy, by invitation of Professor Canaperia.

Dr. Joan Taylor visited the U.S.A., Mexico, and Canada to speak at the XII International Congress of Paediatrics at Mexico City, and to undertake a lecture tour of Canadian centres.

Dr. L. H. Turner accepted an invitation from Professor Babudieri to attend a Round Table discussion on "Fine Morphology of Spirochaetes" at the Fifth Congress of Parassitologia, in Trieste, Italy.

VISITING WORKERS

Many people spent periods at the laboratories at Colindale, Aberystwyth, Bournemouth, Carmarthen, County Hall, Exeter, Gloucester, Guildford, the Leptospirosis Reference Laboratory, Liverpool, Manchester, Middlesbrough, Oxford, Portsmouth, Sunderland, Swansea, the Tuberculosis Reference Laboratory, and the Venereal Diseases Reference Laboratory.

ROUTINE WORK OF THE SERVICE

In 1968 the 62 Regional and Area Laboratories of the Service examined 3,310,000 specimens, of which 134,633 were virological. As before, the work came from hospitals, local health authorities, general medical practitioners, and veterinarians. The routine work continued to provide the basis for numerous epidemiological investigations and for a number of surveys. The extent and nature of these activities may be judged from the committees and working parties (pages 47 to 52, Appendix I) and of lists of published papers (pages 53 to 61, Appendix II).

SCIENTIFIC WORK

Saturday morning in a Joint Laboratory. Laboratories which undertake hospital and public health microbiology accept a heavy commitment. The kind of activity in which the laboratory is often involved is well illustrated by one Director's account of a Saturday morning last December.

"Acting on advice to reassess and take stock, I went to work on Saturday morning in a spring-cleaning frame of mind. Only last week I had had an item put on the agenda of the Medical Advisory Committee giving details of the remorseless increase in the numbers of patients on whom I have done skin tests for allergies. There was a 70 per cent increase in 1968 over 1967. It is clear that this duty (about which I have learnt some wisdom and skill) is now beginning to take an unrealistic slice of time and thought and I want to try and shed or share the load. I wanted to give some time to considering how to make this case to the best advantage.

“As a result of one communication to the last staff meeting, I recollected a short paper on a *Shigella sonnei* food poisoning outbreak which I had roughed out last year and put aside. It has two points of real interest and is a co-operative effort with a colleague, a Medical Officer of Health, which is all to the good; and it ought to be written now for publication. An article which a fellow director and I are hoping to write for the P.H.L.S. book is about half done. I could have spent time on any of these, or on several other items and letters. In the event there was no time for any of it. It might be of interest therefore to give a full account of what actually took up my time last Saturday morning.

“After gathering up the threads of Friday, when I was at the staff meeting, with the help of the reduced staff normally on duty on Saturday morning, I went through and signed the reports so that they could be taken down to the hospital by 11 a.m., photocopied, and sent out that day. Some, as usual, were telephoned; some needed discussion, written comment or adjustment. Isolation of *Shigella sonnei* from a ward in a mental hospital required discussion on the phone with the psychiatrist on whether, and what, antibiotic treatment was indicated. This was followed in quick succession by another telephone discussion with a practitioner (at his request) about two patients with urinary findings that proved difficult to interpret; a talk with the assistant matron about a bacteriological question in the current theatre nurses’ course examination; the offer of advice to a consultant colleague about the dangers of his operating with a discharging boil on his arm.

“No sooner had I put the phone down than a practitioner, from a place 12 miles away, rang up to ask for prophylactic immunoglobulin for the parents of two schoolgirls, one of whom had developed infective hepatitis and come home with it. Their father, owing to a chronic illness, was specially at risk. Of course I offered the immunoglobulin and the doctor said that he was sending the father to collect it. While waiting for him I went through and signed the monthly accounts for dispatch. The patient arrived soon after 11 a.m. Thinking he might be the better for a word of friendly reassurance, I took him into the technicians’ room, introduced him, gave him coffee, and got him to talk about research of cross-breeding of fodder grass. (He had just been to Holland and West Germany studying this aspect of his farm business.)

“Just as I was handing him the immunoglobulin, I was called to the telephone by a real enthusiast—one of the consultant paediatricians who is always to be found in our hospital on Saturday mornings. He wanted me to see a small boy with a curious scalp abscess that might be of fungal origin. I went to the ward and came back with the boy and his parents to take specimens to make sure that it was not a bacterial infection. Just as I was about to do this, sister in charge of the Regional Burns Unit telephoned about two unexpected cases of streptococcal infection, and we arranged to examine swabs from all the staff. At this point the paediatrician, his registrar, and his house physician came in and we had a cheerful but not a rapidly concluded discussion round the microscope about the possible aetiology of the lesion in which he was interested. The specimens have since been sent off to the Reference Laboratory.

“I went to my room and started to collect my wits. Soon there was a knock at the door and an 18-year-old student technician from the hospital pathology staff, working in my laboratory as part of her training, asked to speak to me. It seemed that she had had symptoms suggesting early rheumatoid arthritis on

and off for the past nine months. While working in a shop in London in August she had visited a teaching hospital, had been referred to a practitioner, and had been given a week's supply of butazolidine without investigation and without follow-up. The symptoms had reappeared recently. I asked who her doctor was. Her father, a doctor of medicine, told her to ask my advice before seeing him, she said. So, when she had left the room, I rang up her doctor, explained the situation and fixed for her to see him for investigation on Monday morning. By this time it was too late to do anything else.

"Saturday finished on a note of unusual interest. One of my technicians had taken two blood cultures on Thursday from a young man with a history suggesting rat-bite fever. At 9.30 p.m. this technician phoned me at home to say that he couldn't wait to see what he had grown, and that this was almost certainly *Streptobacillus moniformis*. I thanked him and rang up to advise the physician on duty to start the patient on penicillin. This will involve me in a 15-minute dissertation on rat-bite fever at the next (weekly) clinico-pathological meeting in the hospital group, and I shall have to find time to prepare an adequate talk on the subject.

"None of this could have been sidestepped; and it is from such time-consuming activities that we build up a feeling of fellowship within the medical community. It will not be easy to break such strong and valued relationships if we are compelled to contract our hospital duties. It is from these contacts that our epidemiological and investigative activities naturally arise and grow."

Investigation of hospital outbreaks of gastro-enteritis. The Salmonella Reference Laboratory was invited to investigate an outbreak of gastro-enteritis in a maternity hospital in the North Midlands. The organism responsible was *S. virchow*, and the outbreak mainly involved premature babies in the special care baby unit; but there were some cases in other wards of the maternity hospital.

A mother was admitted and delivered of a premature baby who was taken into the special care unit. This baby developed diarrhoea and was barrier nursed; as no pathogenic bacteria were isolated, this baby was moved to a second ward in the special care unit and barrier nursing was stopped. This baby continued to have diarrhoea and further tests showed the presence of *S. virchow*. This baby's mother admitted to having had diarrhoea about nine weeks before delivery, and on investigation she was found to be excreting *S. virchow*. After the admission of this baby, 10 babies in the special care unit, one of whom died, developed diarrhoea due to *S. virchow* and seven others were found to be symptomless excretors. In other wards of the hospital five babies had diarrhoea due to this same organism; four babies, six mothers, six members of the nursing staff and one porter were also found to be excretors.

On further investigation it was found that the mother of the first infected baby was very fond of spit-roasted chicken, which she bought from a shop supplied from a packing station in Cheshire. Chickens from this source caused an outbreak due to *S. virchow* in the Liverpool area.^{1, 2}

Within the maternity hospital the outbreak was controlled by the closure of the special care baby unit which was then thoroughly cleansed. Recommendations were made which would assist in the prevention of further outbreaks.

Some mothers and babies returned home and then developed diarrhoea, in some instances other members of the family became infected with *S. virchow*.

This outbreak illustrates the danger and hazards of cross-infection in an institution when a patient with an infectious diarrhoea remains undiagnosed and as a result no special precautions are taken. Cross-infection within the home is a hazard which a family should be willing to accept, because with careful hygiene it is unlikely that other members will have symptoms even though they may become healthy excretors. A baby infected in early life very commonly continues to excrete salmonella for about a year and more harm will be done by keeping such a baby in hospital than by allowing it to return home, always provided that members of the family are instructed in methods of hygiene.

Sporadic cases of *S. virchow* infection continued to be recorded in 1969 from the Midlands and North of England. Presumably the infection was acquired from *S. virchow*-infected chickens. Very few cases were detected south of a line drawn from the Wash to Bristol.

Outbreaks of gastro-enteritis in hospitals are commonly caused by other groups of organisms, notably certain serotypes of *E. coli*. In 1956 Charter³ described *E. coli* 0114 which caused an outbreak of infantile gastro-enteritis in a Birmingham hospital⁴ and four sporadic cases in the London area. Since 1955 very few cases due to this serotype have been encountered. During the past few months two outbreaks were discovered in two London hospitals, and one baby died. In the past search has been made for the source of the infection, and this has always been traced to contact usually with another infected baby, occasionally with an infected toddler, and very rarely with an infected adult.

The enteritis-producing serotypes of *E. coli* are host specific. Those types affecting humans do not cause disease in other animals. *E. coli* enteritis is common in all young domesticated animals which have been studied, but the swine types affect only swine and the same is true of calf, chicken, and other host specific types.

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Travellers' diarrhoea. The traveller newly arrived at his destination, particularly one in a warm climate, is commonly affected by acute diarrhoea. The distribution is world wide although the greatest risk is in areas with a low standard of hygiene. Despite the global distribution, the clinical picture tends to be uniform. The newcomer and not the resident is attacked. The maximum incidence is in the first two weeks after arrival and the attack is usually self-limiting. In 1965 bacteriological studies were made on Army units moving from the United Kingdom to the Middle East. One hundred men were studied in detail.

Cases of diarrhoea began to appear about four days after arrival, the incidence reached a peak at 10 days, and then dropped off up to 14 days. In the subsequent weeks cases of diarrhoea continued to appear but no peak incidence was found. From all the subjects who suffered from diarrhoea in the first 14 days, a specific serotype of *E. coli* was isolated from the faeces of 54.5 per

cent. Five-and-a-half per cent of the patients suffered from gastro-enteritis due to a salmonella; and in 40 per cent *E. coli* of various O groups were found which could not be related to the symptoms. The peak of the isolations of the specific serotype corresponded well with the peak incidence of the cases of diarrhoea. This specific serotype was not isolated from any healthy subject in Aden nor has it been found in the United Kingdom, except in a case of laboratory infection associated with this work.

The maximum incidence of travellers' diarrhoea is found in the first two weeks after arrival in a new area. This work suggests that in Aden in 1965 this specific serotype of *E. coli* caused diarrhoea in about 50 per cent of the cases of travellers' diarrhoea.

Influenza in Britain, 1968-69. For several years now, the Epidemiological Research Laboratory has accumulated information on the epidemiology of influenza in Britain. The information comes through the collection of weekly figures for sickness benefit claims, mortality rates, general practitioner returns, and the isolation of influenza viruses in public health and other laboratories all over the country. A close correlation has been found to exist between high rates, particularly between those for mortality and the detection of influenza virus in the community. Thus a fairly accurate picture of the pattern of epidemics in the past decade has emerged and the importance of influenza virus as a pathogen confirmed.

It would clearly be useful, however, to be able to predict the pattern in advance, to provide some help in planning vaccination programmes. To this end continuing studies are made both of the antigenic structure of the currently circulating viruses and of the antibody in the population directed against them. Both these factors play a part in the development of epidemics and both are constantly changing because influenza viruses, unlike others, have the ability readily to undergo antigenic variation. When a major change in sub-type appears, as in 1957, serious epidemics are inevitable; but prediction in later years is much less certain.

Antibody to prevalent viruses may be measured and estimations made of the proportion of the population at risk. Should a new variant suddenly appear this antibody may be ineffective if the antigenic shift is sufficiently marked. For example, in the epidemic of 1967-68 although antibody to earlier influenza A2 viruses was widespread, the appearance of the Tokyo/68 variant, against which antibody was infrequently found, may have contributed to the development of an epidemic of unexpected size.

The reports of a variant virus, even more changed, which was causing a big epidemic in Hong Kong early in 1968 gave fair warning of its epidemic potential. This was confirmed by its rapid spread to other parts of the world. Surveys in Britain indicated that antibody against this virus was absent from over half of the population in general. When found the titres were low. However, among school-age children and young adults a much smaller proportion were without some antibody. From this picture it was clear that conditions were suitable for a sizeable epidemic and strenuous efforts were made by manufacturers to produce vaccine to protect those particularly at risk.

The first isolation of the Hong Kong variant in Britain was in early September from a two-year-old child living in London. The source of infection was not

found and no illness developed in contacts. Other than virus isolations from two people who arrived ill from the Far East at the end of September the only other reported cases of infection came from a boys' boarding school in Surrey, an outbreak most likely started by the return to school of a pupil from the East.

From the end of September until the end of December there was no evidence of any influenza in the country except in another boys' boarding school in Oxford. Then viruses began to be isolated in greater numbers, curiously enough at first in almost every instance from someone arriving from the U.S.A., where it was clear that a considerable epidemic was in progress. With the wide seeding of virus from this source it was anticipated that Britain would shortly follow suit, but for reasons which can only be guessed at a similar epidemic did not develop in this country. Indeed except for a short but sharp rise in sickness benefit claims in the West Midlands, were it not for the considerable number of virus isolations made throughout the country, the winter of 1968–69 would have passed as free from influenza in so far as the other indices used to estimate influenza prevalence remained almost unchanged.

There are various possible reasons which might account for this. Although the Hong Kong/68 virus shows a greater shift than has been observed previously among the A2 viruses it still has common antigenic components, and this relatedness is shown by the fact that although the virus is new, nearly half the population has some, albeit low-titre, antibody against it. The actual amount of antibody needed to protect is uncertain, but it is possible that even these low titres have some effect. Another modifying factor could well be the protection afforded by the vaccine which became available for high-risk groups. The publicity accorded to the Hong Kong virus certainly reinforced the recommendations made by the Department of Health and Social Security that such groups should receive priority in vaccination programmes.

Routine examination of bone meal for salmonellas. Since 1947 bone samples have been routinely examined at Cardiff Public Health Laboratory. Until 1957 these specimens were examined only for *B. anthracis* because of the local problem of cutaneous anthrax in the area.¹ Demonstration of the presence of salmonellas in bone products by Walker² shifted the emphasis of investigation to the salmonella group and to what, at that time, were called Arizona paracolons (Subgenus III salmonellas). Development of methods for examining samples contaminated with multiple salmonella serotypes³ allowed detailed and prolonged studies to be made on the range of salmonellas contained in crushed bone fragments imported from India and Pakistan. This investigation resulted in the evaluation of a serological technique in which each serotype isolated from a sample was identified in terms of its H antigens and then removed serologically from the mixture. The process was continued until further salmonellas failed to be isolated. The range of serotypes found has been published.^{4, 5}

In 1967, owing to publicity given to an isolated incident of cutaneous anthrax in Cardiff docks, the laboratory was approached by a large firm of fertilizer manufacturers. Arrangements were made, with the collaboration of Carlisle Public Health Laboratory, to examine periodic shipments of bone meal from India, Pakistan, Lebanon, and Argentina. In Carlisle these samples were examined only for *B. anthracis*. In Cardiff they were examined for *B. anthracis* and in detail for their qualitative salmonella content. The material appeared

ideal to test the validity of a previously expressed theory that the incidence of *S. typhimurium* in a product was best investigated by a more specific cultural technique.⁶

The method was basically simple and was divided into four stages:

(1) *The pre-enrichment stage.* Bone samples were cultured in nutrient broth for 24 hours at 37°C.

(2) *The enrichment stage.* Double-strength selenite F broth was added to the bones and broth and the container and contents transferred to a 43°C water bath and incubated for 24 hours. Subculture was made to brilliant green MacConkey agar and deoxycholate citrate agar. Selective agars were incubated at 37°C for 24 hours and suspected colonies picked for further examination.

(3) *The secondary enrichment stage.* The growth was wiped off the deoxycholate citrate agar plates with cotton-wool swabs on short wooden applicators. These were then inserted into the inner tubes of modified Craigie tubes⁶ and incubated at 37°C for 24 hours. Surface growth appearing outside the inner tube was subcultured to brilliant green MacConkey agar. Plates were incubated at 37°C for 24 hours and examined. Colonies were picked as in Stage 2.

(4) *The specific enrichment stage.* The term specific is relative. Two drops (2×0.02 ml) of the following H phase I agglutinating sera were added to 20 ml of 0.15 per cent nutrient agar:

a, b, c, d, E, G, k, L, r, y, z, z₁₀, z₂₉, z₄z₂₃.

Two similar drops of H phase II serum (factors 1–7) were then added to the soft agar, and sera and agar were gently mixed. This polyvalent serum-agar combination was then used as described by Harvey and Price⁵ in a modified capillary pipette to re-examine all positive samples. Serotypes corresponding in H antigen to the added agglutinating sera were usually immobilised at the distal end of the pipette, whereas serotypes with “i” as H antigen migrated to the surface. The use of capillary pipettes was a natural choice, as the Cardiff laboratory has had past associations with early workers in Sir Almroth Wright’s laboratory.⁷ By conventional techniques in Stages 2 and 3, 12 strains of *S. typhimurium* were isolated from 268 samples of bone meal. Using the more specific technique of Stage 4, a total of 60 strains of *S. typhimurium* were isolated from the same samples.

The investigation was prompted by a desire to gain knowledge of the incidence of *S. typhimurium* in different imported bone meals and also to ascertain the range of serotypes to be expected in material exported from different countries.

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Virus diagnostic reagents. It is of the utmost importance that regular assessment should be made of the continued efficiency and value of each reagent used in the study of infectious diseases in order to avoid any unnecessary work and expense either in the preparation or in the use of viral diagnostic reagents. When this is done it sometimes becomes necessary to make alterations either by replacing one reagent with another or by withdrawing a reagent, or group of reagents, from routine use. Additional reagents are made available in accordance with research developments and with provision of facilities for their preparation without detriment to the supply of those already in use.

Strains of a virus type may be isolated sporadically which differ antigenically in varying degree from the prototype strain used in the preparation of a serum, and a dose of antiserum as much as 10 times the concentration required to neutralize the prototype strain may be needed to type them.¹ From time to time, antigenic variation in field strains is of such magnitude that an antiserum becomes wholly ineffective in neutralisation tests, and a new serum prepared from the current strain is required. Field strains of the enteroviruses frequently show moderate degrees of antigenic variation.²⁻⁵ A more extensive change in a virus was found during an outbreak in 1965⁶ when the issued Cocksackie Group B polyvalent serum failed completely to hold back the current strain of Cocksackie B5, and a new serum had to be prepared. Similarly, during the last decade influenza A strains, although continually isolated with minor antigenic differences, have shown major changes on two occasions, first with the A2 strain in 1962 and more recently with the Hong Kong strain in 1968. On each occasion a new neutralisation serum was required. For the first time in 1968 an antiserum, already RDE-treated, was issued for specific typing by haemagglutination-inhibition in addition to the new neutralizing serum.

After being available for a number of years antigens used in diagnostic complement fixation tests are sometimes withdrawn. This may follow the disappearances, albeit temporary, of a virus as a cause of infection. Lymphocytic choriomeningitis has rarely been diagnosed in Britain in recent years; the antigen was withdrawn from general use in 1964. Two of the parainfluenza antigens (types 1 and 2) were withdrawn after it was realized that they became unreliable for serological typing once a patient had been infected by any one of the parainfluenza viruses. They would then be of value for the diagnosis of specific disease only in primary infections which are common in very young children. The subsequent recommendation to use Sendai, to replace parainfluenza type 1, and parainfluenza type 3 antigens was made in the belief that together they would react sufficiently to diagnose secondary infections by any one of the three types. This assumption, however, is at present under review. Withdrawal of antigens has also followed the widespread use of vaccines. In this connection, results with the polioantigens in complement fixation tests collected over a number of years by the Standards Laboratory (unpublished) have failed to demonstrate that they provided information of any significance in the diagnosis of a small number of sporadic cases of poliomyelitis. Even in epidemics, once established, the interpretation of positive serological findings in tests would be handicapped by the widespread prophylactic use of a live polio vaccine. It therefore appeared that the antigens would be of diagnostic value only in rare cases in which the patient had had no previous contact with a poliovirus either as a result of infection or from immunisation. The routine use of such antigens in all undiagnosed cases of meningitis, encephalitis and paralysis when they are so

difficult and expensive to produce, was not justified and for this purpose they were withdrawn.

For many years human convalescent sera, issued as positive controls for complement fixation tests, were the only sera available for typing certain virus isolates. Although they often produced reliable results, there was always the possibility that if the homologous titre was not high, heterologous antibodies, known or unknown, might react with an unknown virus and might either give a false positive result or, even more important, mask the presence of a new agent. Gradually, specific animal sera against influenza A, B and C viruses, adenovirus and mumps virus were prepared in guinea-pigs, and these rather than human convalescent sera should now be used for typing isolates in tests by neutralisation or complement fixation. Other typing sera appeared after the recognition of additional serotypes of viruses within groups already known. For example, there are now neutralising antisera to 30 types of adenoviruses, and 34 types of echoviruses.

Great difficulties have been encountered in the preparation of some new antigens. Extensive investigations on rubella infection were held up because of the problem either of performing neutralisation tests on a large scale or of supplying sufficient complement-fixing antigen. These problems were overcome when the haemagglutination-inhibition test was introduced.⁷ Once a suitable strain was found which could be easily maintained in a continuous line of cells, and given the right conditions, the production of large quantities of haemagglutinin was possible. The demand for this reagent is likely to be heavy, certainly until the use of a vaccine has eliminated as far as possible rubella infections of pregnant women, and thereafter if it is found useful in tests which provide information on the immunological state of the population. Only limited success has so far been attained in the preparation of a cytomegalovirus antigen. At present each batch of antigen requires two to three weeks to prepare, and the quantity produced in comparison with other antigens is extremely small. On this account it is necessary to restrict its use to the study of limited planned investigations in which, to reduce wastage, the serology will be done in a small number of centres. The same kind of difficulty seems likely to arise in work on EB virus and its relation to infectious mononucleosis, and the same restriction on its use will have to be applied. From experience with these two problems it may be that further planned investigations, which are so admirably suited to the facilities provided by the P.H.L.S., may be undertaken of other viruses, now diagnosed in a more random way, especially if economic considerations become of over-riding importance.

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Rubella—recent developments. Rubella is now a notable, if not a notifiable, disease. This is due to the congenital abnormalities induced by its causative virus in infants of susceptible mothers infected in early pregnancy. Such effects result from the viraemia and the ability of the blood-borne virus to cross the placental barrier and invade the embryonic tissues.

Ordinarily, as with other virus diseases, specific immunity, measurable as antibody, follows infection. This immunity is persistent and, there being but one virus serotype known, protective so that further attacks of rubella are uncommon. It is now clear that some 80 per cent or more of adult female populations are immune to rubella because of past infection and irrespective of whether or not they can recall having had an attack of the disease.¹ It is unlikely that male populations, if similarly sampled, would show any marked difference. This means that practically all batches of immunoglobulin prepared from the pooled plasma of adult blood donors should contain some rubella antibody. If injected in adequate amount immunoglobulin could therefore provide an umbrella of passive immunity over a short period. On this assumption, though unconfirmed at the time because rubella virus had not then been identified,² and because of its short-term protective effect on measles³ and poliomyelitis,⁴ the practice of giving immunoglobulin to mothers exposed to rubella in early pregnancy was begun in this country in 1954 and has continued since. Evaluation of the effectiveness of this regime, though studied first on purely epidemiological grounds⁵ and then by combined epidemiological and laboratory methods,¹ has been made difficult by a number of factors.

Inoculation of a pregnant woman with immunoglobulin is done after exposure to a clinically diagnosed index case of rubella. There is a further delay before the globulin is secured. Some 80 per cent of these women already are immune and unlikely to suffer re-infection and not all index cases presenting with a rash have true rubella. On the other hand, the person still susceptible is at much greater risk when the index case is a member of the same household because of the closeness and continuity of exposure, particularly since anyone already incubating the disease may be infectious due to virus excretion from the throat for several days before the rash and other signs of illness appear. When judged by these latter criteria immunoglobulin given *after* exposure to rubella is as ineffective as it is in other diseases.

The danger of rubella to pregnant mothers has stimulated efforts to clarify and overcome the problem. Laboratory diagnosis is now reaching the stage when it should be possible to examine sera from all women of child-bearing age for susceptibility or immunity. The preparation of suitable vaccines and their effectiveness in inducing immunity to rubella is being investigated in a number of countries including the United Kingdom.⁶ The vaccines contain live virus sufficiently attenuated to be capable of stimulating antibody formation in those susceptible while causing no or the minimum of side effects. Unfortunately a small amount of the vaccine virus may be excreted from the pharynx for a short period after inoculation. However, numerous attempts to transfer this virus to non-immune persons by close and continued exposure have consistently failed.

Once rubella vaccine is available it may be used to protect susceptible young adult women provided they are not pregnant at the time of vaccination. The eventual outcome could be that natural immunity is allowed a chance to develop

during childhood but girls in their early teens still not immune, will then be vaccinated in the expectation that the immunity will last during early adult life.

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Pakistan-SEATO Cholera Research Laboratory. In recent years the Service has given increasing support to a joint U.S.A.-Pakistan-British venture to study cholera in East Pakistan. The Pakistan-SEATO Cholera Research Laboratory at Dacca in East Pakistan is situated in a land intersected by waterways; great rivers and small canals which serve as major transport channels and beside which and on which most of the population live. It is situated in a country where cholera, the classic example of a water-borne disease, is common, at least during the epidemic season from November to January. The period from July 1967 to June 1968, however, was exceptional in that only 224 cases of cholera were admitted to the special treatment ward attached to the laboratory at Dacca. Nevertheless 1,100 non-cholera patients were admitted with a variety of other illnesses which included amoebic and bacillary dysentery and many children with kwashiorkor-like conditions. The main physiology, chemistry, immunology and bacteriology laboratories are located at Dacca; but there are now considerable epidemiological research undertakings at Chittagong and at Matlab Bazaar in Comilla District.

At Chittagong the investigation has developed as a result of the isolation of the El Tor biotype of cholera vibrio on a number of occasions; at Dacca and Matlab Bazaar it has been the classical type of cholera vibrio that has been isolated. It is hoped that it will be possible to collect enough information to be able to compare the clinical and epidemiological pictures of cholera due to the El Tor and the classical vibrios. Night soil is being systematically sampled in certain areas of the city and the contacts of all bacteriologically positive cases are examined for the presence of vibrios. There is some laboratory evidence, however, that after inoculation of night soil with El Tor and the classical cholera vibrios the El Tor vibrios can be isolated for a much longer period than the classical vibrios although the numbers in the original inocula were the same. There is need for further work to discover if there really is a difference in the field and whether this is any way due to differences in viability or any other characteristic of the two organisms detectable in the laboratory.

Matlab Bazaar is the centre for extensive vaccine trials which have been proceeding for several years. By now a quarter of a million people living in over 200 villages are under careful and constant surveillance. All cases of diarrhoea are recorded and rectal swabs sent for culture. Cases of cholera are transported to the ward at Matlab by motor-boat ambulances and treated there.

The incidence of cholera in this population is therefore fairly accurately known and it is possible to compare the vaccinated with the non-vaccinated control group. The immune state of the population is estimated by the measurement of vibriocidal antibody levels which are estimated by a micro-technique using a drop of blood obtained by finger prick. The average antibody levels in non-vaccinated children show a rise with age which suggests that they have received subclinical infections. Antibody levels in the vaccinated show a sharp peak after a booster dose, declining again later although not to the level in the unvaccinated group. The vaccine first used contained Inaba and Ogawa organisms, but later trials have been made with monovalent Inaba or Ogawa organisms; there is some evidence that the monovalent vaccines give equally good protection. Trial has not yet been made of a cholera toxoid. These studies are continuing.

After the epidemic of 1968–69 results should be available for a more certain assessment of the protective values of the vaccines already tried.

The Bacteriology Department bears a heavy burden of work in support of all these epidemiological investigations. It is hoped to continue the study of a group of vibrios of uncertain taxonomic position. The production of vibriocines by strains of *Vibrio cholerae* and their possible use in typing and a more careful analysis of the part played by shigellas in non-cholera diarrhoea in East Pakistan are other subjects for investigation in the laboratory.

The P.H.L.S. has helped the bacteriological work of the Cholera Research Laboratory (C.R.L.) with advice and consultation. Sir James Howie, as a member of the Technical Committee of C.R.L., is always available to give advice, and he makes an annual visit to Dacca for the meeting of the Technical Committee during the cholera season. Dr. K. Patricia Carpenter visited Dacca in January 1968 and gave valuable advice and encouragement. She continues her liaison with the laboratory by identification of shigella and other organisms. Dr. A. L. Furniss of the Public Health Laboratory at Maidstone visited the laboratory at Dacca for a few months at the end of 1968 and gave valuable detailed help in designing and starting a scheme to upgrade the laboratory facilities, organisation and programme. He hopes to make further visits to supervise and assist progress.

J. D. WHITTAKER, M.B.E.

Mr. J. D. Whittaker was appointed Secretary to the P.H.L.S. Board from 1st April, 1968, upon the retirement of Mr. D. V. T. Fairrie.

Born and educated in Edinburgh, James Whittaker worked for eight years in the Department of Therapeutics in the University. From 1939 to 1946 he saw war service with the R.A.M.C. in the Middle East, India, and Burma. He became a Staff Captain and a D.A.D.M.S., and he was awarded the M.B.E. (military) in 1943.

From 1946 onwards he was a member of the administrative staff of the Medical Research Council; and between 1946 and 1961 he played a substantial part in P.H.L.S. affairs, dealing in turn with matters of supply, accommodation, and finance. Despite his withdrawal from our immediate affairs between 1961 and 1968, his return revealed that his memory of and interest in the P.H.L.S.

were as keen as ever and that many lasting friendships with Directors had been made during this earlier 15-year period with the Service.

We wish him a further happy and profitable term with us and congratulate ourselves on our good fortune in being able to welcome him back.

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J. V. S. Pether, M.A., B.M., M.C.Path.,
D.T.M. & H., Dip.Bact. (*Acting
Director*)

F. B. Greatorex, F.I.M.L.T. (*Head
Technician*)

Miss Janet Wynne Jones (Mrs. Bhattacharjee), M.B., M.R.C.S., M.C.Path.,
Dip.Bact.

Miss Phillipa H. Trevains, B.Sc.

TRURO:

Public Health Laboratory, Royal
Cornwall Hospital (City), Infirmary
Hill, Truro

Tel.: Truro (STD 0872) 3029

G. I. Barrow, M.D., M.C.Path.,
Dip.Bact. (*Director*)

C. Ellis, F.I.M.L.T. (*Head Technician*)

WAKEFIELD:

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Street, Wakefield

Tel.: Wakefield (STD 0924) 76961

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Dip.Bact. (*Director*)

G. Denton, F.I.M.L.T. (*Head Technician*)
H. Fennell, B.Sc.

WATFORD:

Public Health Laboratory, 6 Rickmans-
worth Road, Watford, WD1 7HJ

Tel.: Watford (STD 92) 21369

B. R. Eaton, M.B., M.C.Path., D.C.H.
(*Director*)

Miss Hilda Taylor, F.I.M.L.T. (*Head
Technician*)

WINCHESTER:

Public Health Laboratory, Royal
Hampshire County Hospital,
Winchester

Tel.: Winchester (STD 0962) 3807

M. H. Hughes, D.M., M.C.Path.,
D.T.M. & H., Dip.Bact. (*Director*)

A. G. Dick (*Head Technician*)

J. C. K. Mills, M.A., M.B., Dip.Bact.

WOLVERHAMPTON:

Public Health Laboratory, New Cross
Hospital, Wolverhampton

Tel.: Wolverhampton (STD 0902)
731021

C. H. L. Howells, B.Sc., M.D., F.C.Path.
(*Honorary Director*)

I. A. Harper, M.B., M.C.Path.

V. G. Kitchen, F.I.M.L.T. (*Head
Technician*)

WORCESTER:

Public Health Laboratory, Royal
Infirmary, Castle Street Branch,
Worcester

Tel.: Worcester (STD 0905)
25238/9

R. J. Henderson, M.D. (*Director*)

H. R. Jenkins, F.I.M.L.T. (*Head
Technician*)

M. B. Skirrow, M.B., Ph.D., M.C.Path.,
D.T.M. & H.

REFERENCE LABORATORIES

These Laboratories normally receive specimens only from other laboratories within or without the Service.

CROSS-INFECTION REFERENCE LABORATORY:

(incorporating the *Staphylococcus* and *Streptococcus* Reference Laboratories):

Central Public Health Laboratory,
Colindale Avenue, London, N.W.9
Tel.: Colindale (STD 01-205) 7041

M. T. Parker, M.D., F.C.Path.,
Dip.Bact. (*Director*)

Mrs. Elizabeth A. Hall Asheshov, Ph.D.,
M.C.Path., Dip.Bact.

D. C. J. Bassett, M.B., Dip.Bact.

Mrs. Brenda M. Brock, B.Sc.

*N. Foord, B.Sc.

Miss Diana R. France, M.Sc.

Miss Doris L. Grant, M.A.

J. H. Hewitt, M.Sc.

*O. M. Lidwell, D.Phil. (*Deputy Director*)
W. R. Maxted, M.I.Biol., F.I.M.L.T.
(*Senior Technical Officer*)

Mrs. Alison M. Pinney, B.Pharm.

*R. Speers, B.A., Ph.D.

Mrs. Adeline G. Towers, B.Sc., M.B.,
M.C.Path. (*part-time*)

Mrs. Jean P. Widdowson, B.Pharm.,
Ph.D., M.P.S.

Miss Jennifer M. Woods, B.Sc.

DISINFECTION REFERENCE LABORATORY:

Central Public Health Laboratory,
Colindale Avenue, London, N.W.9
Tel.: Colindale (STD 01-205) 7041

J. C. Kelsey, M.D., F.C.Path., Dip.Bact.
(*Director*)

Mrs. Isobel M. Maurer, B.Sc.

DYSENTERY REFERENCE LABORATORY:

Central Public Health Laboratory,
Colindale Avenue, London, N.W.9
Tel.: Colindale (STD 01-205) 7041

Mrs. K. Patricia Carpenter, M.B.,
F.C.Path., Dip.Bact. (*Director*)

Miss Heather Davies, B.Sc.

Mrs. Jacqueline A. Howes, B.Sc.

ENTERIC REFERENCE LABORATORY:

Central Public Health Laboratory,
Colindale Avenue, London, N.W.9
Tel.: Colindale (STD 01-205) 7041

E. S. Anderson, M.D., F.C.Path.,
Dip.Bact., F.R.S. (*Director*)

J. D. H. de Sa, M.Sc., Ph.D.

F. J. Flynn (*Head Technician*)

Miss Ann H. Gilmour, B.Sc.

Miss Jane M. W. Griffiths, B.Sc.

N. D. F. Grindley, B.A.

Miss Eleanor E. Horsfall, B.Sc.

Miss Alison R. Hughes, B.Sc.

Miss June N. Mayhew, B.Sc.

Miss Jacqueline Payne, B.Sc.

H. R. Smith, B.A.

E. J. Trelfall, B.Sc.

A. B. White, M.B., Dip.Bact.

LEPTOSPIROSIS REFERENCE LABORATORY:

London School of Hygiene and
Tropical Medicine, Keppel Street,
London, W.C.1

Tel.: Museum (STD 01-636) 8636

L. H. Turner, M.B.E., M.D.,
D.T.M. & H. (*Director*)

R. J. Reed (*Head Technician*)

MYCOLOGICAL REFERENCE LABORATORY:

London School of Hygiene and
Tropical Medicine, Keppel Street,
London, W.C.1

Tel.: Museum (STD 01-636) 8636

I. G. Murray, M.B., M.C.Path.,
D.T.M. & H. (*Director*)

Miss Christine M. Philpot, B.Sc.

MYCOPLASMA REFERENCE LABORATORY:

Central Public Health Laboratory,
Colindale Avenue, London, N.W.9
Tel.: Colindale (STD 01-205) 7041

B. E. Andrews, M.R.C.S., F.C.Path.,
Dip.Bact. (*Director*)

R. A. Hewish, F.I.M.L.T. (*Head Technician*)

R. H. Leach, M.Sc., D.Phil. (*Deputy Director*)

* Members of the external scientific staff of the Medical Research Council.

**SALMONELLA REFERENCE
LABORATORY:**

Central Public Health Laboratory,
Colindale Avenue, London, N.W.9
Tel.: Colindale (STD 01-205) 7041

Mrs. Joan Taylor, M.B., B.Sc.,
F.C.Path., D.P.H. (*Director*)
R. J. Gross, B.A.
Mrs. Mary L. M. Hall, B.Sc.
G. McGimpsey, F.I.M.L.T. (*Head
Technician*)
B. Rowe, M.A., M.B., D.T.M. & H.

**TUBERCULOSIS REFERENCE
LABORATORY:**

Institute of Preventive Medicine,
The Parade, Cardiff, CF2 3UJ
Tel.: Cardiff (STD 0222) 30108

J. Marks, M.D., F.R.C.P., F.C.Path.,
Dip.Bact. (*Director*)
P. A. Jenkins, Ph.D.
J. L. Leat, B.Sc.
P. J. Patterson (*Head Technician*)

**VENEREAL DISEASE
REFERENCE LABORATORY:**

London Hospital Research Labora-
tories, Ashfield Street, London, E.1
*Tel.: Stepney Green (STD 01-790)
3008*

A. E. Wilkinson, M.B., F.C.Path.,
M.R.C.S. (*Director, part-time*)
Miss Nafra A. Johnston, M.D.,
D.R.C.O.G. (*part-time*)
G. Scrimgeour, M.B., M.C.Path.,
Dip.Bact.
A. D. Seth, M.Sc.
C. J. Storey (*Head Technician*)

**VIRUS REFERENCE
LABORATORY:**

Central Public Health Laboratory,
Colindale Avenue, London, N.W.9
Tel.: Colindale (STD 01-205) 7041

A. D. Macrae, M.D., M.C.Path.,
Dip.Bact. (*Director*)
Miss Mary O. Adams (Mrs. Roebuck),
M.B., Dip.Bact.
Mrs. Jean M. Blake, B.Sc.
Mrs. Patricia Chakraverty, B.Sc.
Miss Yvonne E. Cossart (Mrs. Wills),
M.B., B.Sc., M.C.Path., D.C.P.
J. Craske, M.B., M.C.Path., Dip.Bact.
Miss Anne M. Field, B.Sc., Ph.D.
Miss Sylvia D. Gardner, M.B.,
M.C.Path., Dip.Bact.
Miss Wendy A. Knowles, B.Sc.
J. R. McDonald, F.I.M.L.T. (*Senior
Technical Officer*)
Mrs. Eleanor V. Meurisse, M.Sc.
Mrs. Marguerite S. Pereira, M.D.
(*Deputy Director*)
Miss Hazel Ratcliffe, B.Sc.
F. G. Rogers, B.Sc.
Mrs. Elise M. Vandervelde, M.B.,
Dip.Bact.

Note: With the exception of small-
pox and related virus diseases, rabies
and the serology of typhus fever this
laboratory does not receive specimens
for routine diagnosis. Such specimens
are received at all regional and most
area laboratories and enquiries should
be directed to the nearest P.H.L.S.
laboratory.

SPECIAL LABORATORIES

**COMPUTER TRIALS DEPART-
MENT:**

Central Public Health Laboratory,
Colindale Avenue, London, N.W.9
Tel.: Colindale (STD 01-205) 7041

S. P. Lapage, M.B., M.C.Path.,
Dip.Bact. (*Director*)
M. A. Curtis, B.Sc.
W. R. Willcox, B.Sc.

**EPIDEMIOLOGICAL RESEARCH
LABORATORY:**

Central Public Health Laboratory,
Colindale Avenue, London, N.W.9
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(*Director*)
Mrs. Judith R. Diamond, B.Sc. (*part-
time*)
W. B. Fletcher, A.M.R., F.S.S.
J. A. Lee, M.B., D.P.H.
Miss Christine L. Miller
(Mrs. Manning, B.M.) (*part-time*)
D. L. Miller, M.D., D.P.H. (*Deputy
Director*)
Mrs. Sheila Polakoff, M.B., D.P.H.
Miss Mair E. M. Thomas (Mrs. Living-
stone), M.B., B.Sc., F.C.Path., D.P.H.
(*part-time*)
Mrs. Enid D. Vernon, B.Sc.

**EPIDEMIOLOGICAL RESEARCH
UNIT:**

86 Dyer Street, Cirencester, Glos.,
GL7 2PF

Tel.: Cirencester (STD 0285)
3745/3330

R. E. Hope-Simpson, O.B.E.,
F.R.C.G.P., M.R.C.S. (*Director, part-
time*)

P. G. Higgins, M.D., M.C.Path.,
Dip.Bact.

D. A. Woolley, F.I.M.L.T. (*Head
Technician*)

FOOD HYGIENE LABORATORY:

Central Public Health Laboratory,
Colindale Avenue, London, N.W.9

Tel.: Colindale (STD 01-205) 7041

Miss Betty C. Hobbs, O.St.J., D.Sc.,
F.C.Path., Dip.Bact. (*Director*)

A. C. Ghosh, B.Sc., B.V.Sc. & A.H.,
M.Phil.

R. J. Gilbert, M.Pharm., Ph.D.,
Dip.Bact., M.P.S.

Miss Margaret Kendall, F.I.M.L.T.
(*Head Technician*)

Miss Diane Roberts, B.Sc.

Mrs. Magda Šimkoričová,
R.N.Dr. (Czech.)

**NATIONAL COLLECTION OF
TYPE CULTURES:**

Central Public Health Laboratory,
Colindale Avenue, London, N.W.9

Tel.: Colindale (STD 01-205) 7041

S. P. Lapage, M.B., M.C.Path., Dip.Bact.
(*Curator*)

Miss Vivienne E. Ellis, B.Sc.

P. J. Fisher (*Head Technician*)

L. R. Hill, M.Sc. (*Deputy Curator*)

R. J. Owen, B.Sc.

K. D. Phillips, B.Sc.

**STANDARDS LABORATORY
FOR SEROLOGICAL
REAGENTS:**

Central Public Health Laboratory,
Colindale Avenue, London, N.W.9

Tel.: Colindale (STD 01-205) 7041

Mrs. C. M. Patricia Bradstreet, M.B.,
M.C.Path., Dip.Bact. (*Director*)

Miss E. Margaret Bailey, B.Sc.

Mrs. Mabel W. Dighero, B.Sc.

Mrs. Joan M. B. Edwards, M.B.,
M.C.Path. (*Deputy Director, part-
time*)

Mrs. Gillian J. Ellis, B.Sc.

D. R. Fenlon, B.Sc.

J. Foreman, F.I.M.L.T. (*Head
Technician*)

Miss Agnes J. Tannahill, B.Sc.

JUNIOR BACTERIOLOGISTS IN TRAINING

(*Attending course at the London School of Hygiene and Tropical Medicine for
Diploma in Bacteriology*)

N. J. Mitchell, M.B., M.R.C.S. R. Wiseman, M.B.

(*Attending course at the University of Manchester for
Diploma in Bacteriology*)

Miss Margaret E. Macauley, M.B.

STAFF ON SECONDMENT

T. N. Stanbridge, M.B., M.R.C.S., Dip.Bact. (*to University of Manchester*)

*Hospital Pathological Laboratories—designated “ Recognised ”—at
which arrangements are made for the examination of
public health specimens for the Service*

AYLESBURY

Stoke Mandeville Hospital, Aylesbury, Buckinghamshire.

BOLTON

Royal Infirmary, Bolton, Lancashire.

WIGAN

Royal Infirmary, Wigan, Lancashire.

*Consultant Bacteriologists employed by Regional Hospital Boards in the
Hospital Service, who are associated on a part-time basis
with the Public Health Laboratory Service*

F. A. J. BRIDGWATER, M.B., M.C.Path., Dip.Bact.

East Birmingham Hospital, Bordesley Green East, Birmingham, 9.

Tel.: Birmingham (STD 021) 772 4021.

T. H. FLEWETT, M.D., F.C.Path.

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Tel.: Thornton Heath (STD 01-684) 6999.

D. C. TURK, D.M., M.R.C.P., M.C.Path.

Department of Bacteriology, Radcliffe Infirmary, Oxford. Tel.: Oxford (STD 0092) 49891.

REFERENCE EXPERTS

In the following list the name of the expert who is responsible for the relevant examination is given. Reference experts normally receive specimens only from other laboratories within and without the Service. It should be added, however, that all regional and most area laboratories are undertaking the routine diagnosis of virus infections, and that several laboratories are undertaking the serological identification of members of the *Salmonella* group, the serological diagnosis of leptospiral infections, and the bacteriophage-typing of strains of *Staphylococcus aureus*. For this reason enquiries on these subjects should usually be addressed to the local public health laboratory.

Amoebiasis, serological test for

A. L. Jeanes, M.D., M.C.Path., Department of Clinical Pathology, Guy's Hospital, London, S.E.1. Tel.: Hop (STD 01-407) 7600.

Anaerobes, identification

A. T. Willis, M.D., Ph.D., M.C. Path., Public Health Laboratory, Luton and Dunstable Hospital, Lewsey Road, Luton. Tel.: Luton (STD 0582) 52007.

Anthrax bacilli, identification

Miss Joan R. Davies, M.D., Dip.Bact., Bacteriological Laboratory (P.H.L.S.), Room 617, County Hall, London, S.E.1.
Tel.: Waterloo (STD 01-928) 3467.

Anthrax, examination under Wool and Hair Regulations

T. F. Elias-Jones, M.B., F.C.Path., The City Laboratory, 23 Montrose Street, Glasgow, C.1. Tel.: Glasgow (STD 041-221) 9600, Ext. 2400.

H. G. M. Smith, M.B., Ph.D., Dip.Bact., Public Health Laboratory, 16-18 Edmund Street, Bradford, 5. Tel.: Bradford (STD 0274) 24314.

Miss Joan R. Davies, M.D., Dip.Bact., Bacteriological Laboratory (P.H.L.S.), Room 617, County Hall, London, S.E.1.
Tel.: Waterloo (STD 01-928) 3467.

Arboviruses

J. S. Porterfield, M.D., M.R.C.S., L.R.C.P., National Institute for Medical Research, Mill Hill, London, N.W.7. Tel.: Mill Hill (STD 01-959) 3666.

Arizona group, identification

Mrs. Joan Taylor, M.B., B.Sc., F.C.Path., D.P.H., Salmonella Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. Tel.: Colindale (STD 01-205) 7041.

Brucella, identification

D. J. H. Payne, M.B., F.C.Path., Dip.Bact., Public Health Laboratory, St. Mary's General Hospital, East Wing, Milton Road, Portsmouth, PO3 6AQ. Tel.: Portsmouth (STD 0705) 22331.

Cholera and related vibrios, identification

Mrs. K. Patricia Carpenter, M.B., F.C.Path., Dip.Bact., Dysentery Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. Tel.: Colindale (STD 01-205) 7041.

Clostridium welchii, serological typing

Miss Betty C. Hobbs, O.St.J., D.Sc., F.C.Path., Dip.Bact., Food Hygiene Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9.

Tel.: Colindale (STD 01-205) 7041.

Coxsackie A viruses

D. R. Gamble, M.B., M.C.Path., Dip.Bact., Public Health Laboratory, West Park Hospital, Epsom. Tel.: Epsom (STD 01-39) 26633.

Cytomegaloviruses

H. Stern, M.B., Ph.D., M.C.Path., Virus Department, St. George's Hospital Medical School, Hyde Park Corner, London, S.W.1.

Tel.: Belgravia (STD 01-235) 4343, Ext. 147.

Regional Centres for Cytomegaloviruses Complement Fixation Tests

Bristol: Suzanne K. R. Clarke, M.D., M.C.Path., Public Health Laboratory, Myrtle Road, Kingsdown, Bristol, BS2 8EL. Tel.: Bristol (STD 0272) 21326.

Leeds: M. H. Hambling, M.D., M.C.Path., D.O.R.C.O.G., Dip.Bact., Public Health Laboratory, Bridle Path, York Road, Leeds, LS15 7TR.

Tel.: Leeds (STD 0532) 645011.

Manchester: J. O'H. Tobin, B.M., M.C.Path., Dip.Bact., Public Health Laboratory, Withington Hospital, Manchester, M20 8LR.

Tel.: Manchester (STD 061-445) 2416.

Virus Reference Laboratory: Sylvia D. Gardner, M.B., M.C.Path., Dip.Bact., Virus Reference Laboratory, Colindale Avenue, London, N.W.9.

Tel.: Colindale (STD 01-205) 7041.

Diphtheria bacilli, identification

W. H. H. Jebb, M.D., F.C.Path., Public Health Laboratory, Radcliffe Infirmary, Oxford, OX2 6AH. Tel.: Oxford (STD 0092) 49231/2.

Disinfection

J. C. Kelsey, M.D., F.C.Path., Dip.Bact., Disinfection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9.

Tel.: Colindale (STD 01-205) 7041.

Drug Resistance in Enterobacteria

E. S. Anderson, M.D., F.C.Path., Dip.Bact., F.R.S., Enteric Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. Tel.: Colindale (STD 01-205) 7041.

Dysentery bacilli, typing

Mrs. K. Patricia Carpenter, M.B., F.C.Path., Dip.Bact., Dysentery Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. Tel.: Colindale (STD 01-205) 7041.

Enteric Fever

- (a) Serological investigation of suspected cases and carriers.
- (b) Phage-type determination of strains of typhoid and paratyphoid bacilli, and of *Salmonella typhimurium* and certain other salmonella serotypes.

E. S. Anderson, M.D., F.C.Path., Dip.Bact., F.R.S., Enteric Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.*: Colindale (STD 01-205) 7041.

Entomological specimens, investigation

B. R. Laurence, Ph.D., Department of Entomology, London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1.

Tel.: Musuem (STD 01-636) 8636.

Escherichia coli, typing

Mrs. Joan Taylor, M.B., B.Sc., F.C.Path., D.P.H., Salmonella Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.*: Colindale (STD 01-205) 7041.

Farmer's lung, serological diagnosis

I. G. Murray, M.B., M.C.Path., D.T.M. & H., Mycological Reference Laboratory, London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1. *Tel.*: Museum (STD 01-636) 8636

D. G. Davies, M.D., F.C.Path., Dip.Bact., Public Health Laboratory, Cumberland Infirmary, Carlisle. *Tel.*: Carlisle (STD 0228) 23654

J. E. Jameson, M.R.C.S., Public Health Laboratory, Royal Sussex County Hospital, Brighton, 7, BN2 5BE. *Tel.*: Brighton (STD 0273) 63506.

B. Moore, M.D., B.Sc., F.C.Path., B.A.O., Public Health Laboratory, Church Lane, Heavitree, Exeter. *Tel.*: Exeter (STD 0392) 77833.

H. D. S. Morgan, M.R.C.S., M.C.Path., Dip.Bact., Public Health Laboratory West Wales General Hospital, Glangwili, Carmarthen.

Tel.: Carmarthen (STD 0267) 7271.

M. Sussman, Ph.D., M.I.Biol., The Welsh National School of Medicine, Department of Bacteriology, The Royal Infirmary, Cardiff, CF2 1SZ.

Tel.: Cardiff (STD 0222) 33101.

D. M. Weir, M.D., Immunology Unit, Department of Bacteriology, Edinburgh University Medical School, Teviot Place, Edinburgh.

Tel.: Edinburgh (STD 031-667) 1011, *Ext.* 2256.

*Food Poisoning**

Miss Betty C. Hobbs, O.St.J., D.Sc., F.C.Path., Dip.Bact., Food Hygiene Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9.

Tel.: Colindale (STD 01-205) 7041.

* Owing to the perishable nature of most foodstuffs, material for investigation from outbreaks of food poisoning should normally be sent to the nearest public health laboratory. The reference laboratory should be used mainly for non-perishable articles of food, especially when litigation may arise, and for the identification of strains.

Fungi (pathogenic), identification

I. G. Murray, M.B., M.C.Path., D.T.M. & H., Mycological Reference Laboratory, London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1. Tel.: Museum (STD 01-636) 8636.

Helminthological specimens, investigation

Professor G. S. Nelson, M.D., D.Sc., D.T.M. & H., D.A.P. & E., London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1. Tel.: Museum (STD 01-636) 8636.

Hydatid disease, complement-fixation test for

Mrs. C. M. Patricia Bradstreet, M.B., M.C.Path., Dip.Bact., Standards Laboratory for Serological Reagents, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. Tel.: Colindale (STD 01-205) 7041.

Immunofluorescence

C. E. D. Taylor, M.A., M.D., M.C.Path., Dip.Bact., Central Middlesex Hospital, Park Royal, London, N.W.10. Tel.: Elgar (STD 01-965) 5733.

Influenza

L. Hoyle, M.B., Public Health Laboratory, General Hospital, Northampton, NN1 5BD. Tel.: Northampton (STD 0604) 34347.

Mrs. Marguerite S. Pereira, M.D., Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9.
Tel.: Colindale (STD 01-205) 7041.

Leptospiral infections

L. H. Turner, M.B.E., M.D., D.T.M. & H., London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1.
Tel.: Museum (STD 01-636) 8636.

Listeria typing

Miss Agnes J. Tannahill, B.Sc., Standards Laboratory for Serological Reagents, Central Public Health Laboratory, Colindale Avenue, London, N.W.9.
Tel.: Colindale (STD 01-205) 7041.

Malaria parasites and other blood protozoa

Professor P. C. C. Garnham, C.M.G., M.D., D.Sc., F.R.S., Imperial College Field Station, Ashurst Lodge, Ascot, Berkshire.
Tel.: Ascot (STD 0990) 22204.

Meningococci, typing

Mrs. C. M. Patricia Bradstreet, M.B., M.C.Path., Dip.Bact., Standards Laboratory for Serological Reagents, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. Tel.: Colindale (STD 01-205) 7041.

Mycoplasma

B. E. Andrews, M.R.C.S., F.C.Path., Dip.Bact., Mycoplasma Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. Tel.: Colindale (STD 01-205) 7041.

Parasitic infections, serological diagnosis of

D. S. Ridley, B.Sc., M.D., F.C.Path., Department of Pathology, Hospital for Tropical Diseases, 4 St. Pancras Way, London, N.W.1.

Tel.: Euston (STD 01-387) 4411.

Pasteurella pseudotuberculosis

N. S. Mair, M.B., F.C.Path., D.C.H., D.P.H., Dip.Bact., Public Health Laboratory, Groby Road Hospital, Leicester, LE3 9QE.

Tel.: Leicester (STD 0533) 872283.

Plague, investigation

R. J. Henderson, M.D., Public Health Laboratory, Royal Infirmary, Castle Street Branch, Worcester. Tel.: Worcester (STD 0905) 25238/9.

Pneumococci, typing of, from epidemics

M. T. Parker, M.D., F.C.Path., Dip.Bact., Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. Tel.: Colindale (STD 01-205) 7041.

Poliomyelitis, marker tests

Miss Yvonne E. Cossart, M.B., B.Sc., M.C.Path., D.C.P., Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. Tel.: Colindale (STD 01-205) 7041.

Protective cabinets

O. M. Lidwell, D.Phil., Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9.

Tel.: Colindale (STD 01-205) 7041.

Protozoological specimens, investigation

Professor W. H. R. Lumsden, D.Sc., M.B., M.R.C.P., D.T.M.&H., London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1.

Tel.: Museum (STD 01-636) 8636.

Psittacosis, isolation of causative agent

Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. Tel.: Colindale (STD 01-205) 7041.

Rabies, laboratory tests for diagnosis

A. D. Macrae, M.D., M.C.Path., Dip.Bact., Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9.

Tel.: Colindale (STD 01-205) 7041.

Rickettsia

A. D. Evans, M.B., B.Sc., M.C.Path., Dip.Bact., Public Health Laboratory, Institute of Pathology, 3rd Floor, Royal Infirmary, Cardiff, CF2 1SZ.

Tel.: Cardiff (STD 0222) 33101.

Salmonella organisms, typing

Mrs. Joan Taylor, M.B., B.Sc., F.C.Path., D.P.H., Salmonella Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. Tel.: Colindale (STD 01-205) 7041.

Smallpox, laboratory tests for diagnosis

H. R. Cayton, M.B., M.C.Path., Public Health Laboratory, Myrtle Road, Kingsdown, Bristol, BS2 8EL. *Tel.*: Bristol (STD 0272) 21326.

A. D. Evans, M.B., B.Sc., M.C.Path., Dip.Bact., Public Health Laboratory, Institute of Pathology, 3rd Floor, Royal Infirmary, Cardiff, CF2 1SZ. *Tel.*: Cardiff (STD 0222) 33101.

J. H. Hale, O.B.E., M.D., F.C.Path., M.R.C.P., Public Health Laboratory, Institute of Pathology, General Hospital, Westgate Road, Newcastle upon Tyne, NE4 6BE. *Tel.*: Newcastle (STD 0632) 38811, *Ext.* 297.

M. H. Hambling, M.D., M.C.Path., D.(Obst.)R.C.O.G., Dip.Bact., Public Health Laboratory, Bridle Path, York Road, Leeds, LS15 7TR. *Tel.*: Leeds (STD 0532) 645011.

Professor K. MacCarthy, M.D., M.C.Path., Department of Bacteriology, New Medical School, Ashton Street, P.O. Box 147, Liverpool, L69 3BX. *Tel.*: Liverpool (STD 051-709) 6022, *Ext.* 202

A. D. Macrae, M.D., M.C.Path., Dip.Bact., Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.*: Colindale (STD 01-205) 7041.

Professor N. P. L. Wildy, M.B., M.R.C.S., F.R.S.E., Department of Virology and Bacteriology, The University, Birmingham, 15.

Tel.: Birmingham (STD 021-472) 1301. *Night extension*: (STD 021-472) 3524.

Staphylococci, bacteriophage-typing

M. T. Parker, M.D., F.C.Path., Dip.Bact., Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.*: Colindale (STD 01-205) 7041.

Streptococci of Group A, typing

M. T. Parker, M.D., F.C.Path., Dip.Bact., Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.*: Colindale (STD 01-205) 7041.

Regional Typing Laboratories

(i) *Northern and South Eastern counties*: Cumberland, Co. Durham, Lancs., Northumberland, Westmorland, Yorks, Dorset, Hants., Kent, London, Surrey, Sussex.

M. T. Parker, M.D., F.C.Path., Dip.Bact., Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.*: Colindale (STD 01-205) 7041.

(ii) *Eastern Counties*: Beds., Cambs., Derby, Essex, Herts., Hunts., Leics., Lincs., Norfolk, Northants., Notts., Rutland, Suffolk.

Miss Joan M. Boissard, M.R.C.S., Public Health Laboratory, Tennis Court Road, Cambridge. *Tel.*: Cambridge (STD 0223) 55526.

(iii) *Western Counties*: Berks., Bucks., Cheshire, Cornwall, Devon, Glos., Heref., Oxon., Salop., Somerset, Staffs. Warw., Wilts., Worcs.

W. H. H. Jebb, M.D., F.C.Path., Public Health Laboratory, Radcliffe Infirmary, Oxford, OX2 6AH. *Tel.*: Oxford (STD 0092) 49231/2.

(iv) *Wales*.

Professor Scott Thomson, M.D., F.R.C.P.E., F.C.Path., D.P.H., Public Health Laboratory, Institute of Pathology, 3rd Floor, Royal Infirmary, Cardiff, CF2 1SZ. *Tel.*: Cardiff (STD 0222) 33101.

Toxoplasmosis

North

G. B. Ludlam, M.D., F.C.Path., D.T.M. & H., D.L.O., Public Health Laboratory, Bridle Path, York Road, Leeds, LS15 7TR
Tel.: Leeds (STD 0532) 645011.

South (excluding London)

W. Kwantes, M.A., M.B., F.C.Path., Dip.Bact., Public Health Laboratory, Cockett Road, Swansea, SA2 0FA. *Tel.*: Swansea (STD 0792) 24041.

London

D. G. Fleck, M.D., M.C.Path., Dip.Bact., Public Health Laboratory, St. George's Hospital, Tooting Grove, London, S.W.17.
Tel.: Balham (STD 01-672) 1255.

Trichinosis, examination of rats and pigs

Professor G. S. Nelson, M.D., D.Sc., D.T.M. & H., D.A.P. & E., London School of Hygiene & Tropical Medicine, Keppel Street, London, W.C.1.
Tel.: Museum (STD 01-636) 8636.

Tubercle bacilli and other mycobacteria

J. Marks, M.D., F.C.Path., M.R.C.P., Dip.Bact., Tuberculosis Reference Laboratory, Institute of Preventive Medicine, The Parade, Cardiff, CF2 3UJ.
Tel.: Cardiff (STD 0222) 30108.

Regional Centres for Tuberculosis Bacteriology

Bristol: H. R. Cayton, M.B., M.C.Path., Public Health Laboratory, Myrtle Road, Kingsdown Bristol, BS2 8EL. *Tel.*: Bristol (STD 0272) 21326.

Liverpool: G. C. Turner, M.D., M.C.Path., Public Health Laboratory, 126 Mount Pleasant, Liverpool, L3 5SU.
Tel.: Liverpool (STD 051-709) 3636/7.

London: C. H. Collins, M.I.Biol., F.I.M.L.T., Bacteriological Laboratory (P.H.L.S.), Room 617, County Hall, Westminster Bridge, London, S.E.1.
Tel.: Waterloo (STD 01-928) 3467.

Manchester: J. D. Abbott, M.D., M.C.Path., Dip.Bact., Public Health Laboratory, Withington Hospital, Manchester, M20 8LR.
Tel.: Manchester (STD 061) Didsbury 2416.

Newcastle: J. B. Selkon, M.B., D.C.P., M.C.Path., Public Health Laboratory, Institute of Pathology, General Hospital, Westgate Road, Newcastle upon Tyne, NE4 6BE. *Tel.*: Newcastle (STD 0632) 38811, *Ext.* 297.

Wakefield: L. A. Little, M.B., F.C.Path., Dip.Bact., Public Health Laboratory, Wood Street, Wakefield. *Tel.*: Wakefield (STD 0924) 76961.

*Typhus fever, serological tests**

Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.*: Colindale (STD 01-205) 7041.

Venereal diseases

A. E. Wilkinson, M.B., F.C.Path., M.R.C.S., Venereal Diseases Reference Laboratory, London Hospital Research Laboratories, Ashfield Street, London, E.1. *Tel.*: Stepney Green (STD 01-790) 3008.

Venereal diseases, Treponemal immobilisation test

A. E. Wilkinson, M.B., F.C.Path., M.R.C.S., Venereal Diseases Reference Laboratory, London Hospital Research Laboratories, Ashfield Street, London, E.1. *Tel.*: Stepney Green (STD 01-790) 3008.

Midlands

P. J. L. Sequiera, M.B., The Central Serology Laboratory, Withington Hospital, West Didsbury, Manchester, 20.
Tel.: Manchester (STD 061-445) 7683.

North

J. H. Hale, O.B.E., M.D., F.C.Path., M.R.C.P., Public Health Laboratory, Institute of Pathology, General Hospital, Westgate Road, Newcastle upon Tyne, NE4 6BE. *Tel.*: Newcastle (STD 0632) 38811, *Ext.* 297.

* The Weil-Felix test can be carried out in all constituent laboratories of the Service, and also in a number of hospital laboratories. Only sera giving a doubtful reaction should be sent to the Virus Reference Laboratory.

**VACCINES AND OTHER IMMUNOLOGICAL MATERIALS OBTAINABLE
THROUGH THE PUBLIC HEALTH LABORATORY SERVICE**

For the address of P.H.L.S. laboratories *see* pp. 26-35

Typhus Vaccine

Stocks are held by the P.H.L.S. laboratories at:

Birmingham	London (Colindale)
Bristol	Manchester
Cambridge	Newcastle
Exeter	Oxford
Leeds	Sheffield
Liverpool	Cardiff (a)

Rabies Vaccine

Stocks are held by the P.H.L.S. laboratories at:

Liverpool
London (Colindale)
Newcastle
Cardiff (a)

Anthrax Vaccine

Stocks are held by the P.H.L.S. laboratories at:

Bradford
Liverpool
London (Colindale)

Human immunoglobulin

Immunoglobulin prepared from the pooled plasma of normal healthy adults is obtainable on request from any laboratory of the Service. So far as supplies allow, it is issued for the protection of women in contact with rubella during the first three months of pregnancy. It is also issued for contacts of measles and infectious hepatitis in circumstances of special risk.

In addition to normal human immunoglobulin, a stock of immunoglobulin prepared from the blood of persons recently vaccinated against smallpox is held for the treatment of cases of generalised vaccinia, eczema, vaccinatum, accidental vaccinia infections endangering the eye, and, in special circumstances, for the protection of unvaccinated smallpox contacts. This anti-vaccinia human immunoglobulin may be obtained from the P.H.L.S. laboratories at:

Birmingham	Liverpool
Bristol	London (Colindale)
Cambridge	Manchester
Cardiff (a)	Newcastle
Gloucester	Oxford
Leeds	Sheffield
Leicester	

Material for intradermal diagnostic tests

Frei antigen for Lymphogranuloma inguinale, Brucellin for Undulant fever, Trichina antigen for Trichinosis, Hydatid antigen for Hydatid disease, and cat-scratch fever antigen can be obtained from the P.H.L.S. Standards Laboratory, which also issues, to any pathologist, Kveim antigen for sarcoidosis. Enquiries relating to fungal antigens should be addressed to the P.H.L.S. Mycology Reference Laboratory.

Notes on other immunological materials NOT obtainable through the Public Health Laboratory Service:

1. *Antisera for therapeutic use*

Obtainable through the Hospital Pathological Service.

2. *Yellow fever inoculation*

A list of centres can be obtained from the Department of Health and Social Security, Alexander Fleming House, Elephant and Castle, London, S.E.1.

3. *TABC, cholera and other vaccines*

Most of these are available commercially.

4. *Smallpox Vaccine*

Obtainable from Public Health Departments of Local Authorities (Counties, County Boroughs and London Boroughs).

APPENDIX I

COMMITTEES AND WORKING PARTIES

Food Investigation

Chairman and Secretary: J. H. McCoy, M.B., D.P.H.

E. S. Anderson, M.D., F.C.Path., Dip.Bact., F.R.S.	H. G. M. Smith, M.B., Ph.D., Dip.Bact.
R. W. S. Harvey, M.D., M.C.Path., Dip.Bact.	Mrs. Joan Taylor, M.B., B.Sc., F.C.Path., D.P.H.
Miss Betty C. Hobbs, D.Sc., F.C.Path., Dip.Bact.	S. Brightwell, M.Sc., D.I.C., A.R.I.C. (Messrs. J. Sainsbury, Ltd., to give technical advice on trade matters)
W. Kwantes, M.A., M.B., F.C.Path., Dip.Bact.	M. Ingram, M.A., Ph.D. (<i>Meat Research Institute</i>)
H. D. S. Morgan, M.R.C.S., M.C.Path., Dip.Bact.	

Steering Committee on Antibiotic Resistance of Pathogens

Chairman: M. T. Parker, M.D., F.C.Path., Dip.Bact.

Secretary: A. L. Furniss, M.D., Dip.Bact.

J. D. Abbott, M.D., M.C.Path., Dip.Bact.,	T. M. Pollock, M.B., M.R.C.P.(Glasg.)
E. S. Anderson, M.D., F.C.Path., Dip.Bact., F.R.S.	Mrs. Joan Taylor, M.B., B.Sc., F.C.Path., D.P.H.
Mrs. K. Patricia Carpenter, M.B., F.C.Path., Dip.Bact.	A. E. Wright, M.D., M.C.Path., D.P.H., Dip.Bact.
J. C. Kelsey, M.D., F.C.Path., Dip.Bact.	

Standing Committee on Bacteriological Examination of Water Supplies

Chairman: W. H. H. Jebb, M.D., F.C.Path.

Secretary: L. A. Little, M.B., F.C.Path., Dip.Bact.

G. I. Barrow, M.D., M.C.Path., Dip.Bact.	F.W. Bunting, M.B.E., M.D., D.P.H. (<i>Society of Medical Officers of Health</i>)
P. B. Crone, M.D., Dip.Bact.	N. P. Burman, B.Sc., Ph.D. (<i>Metropolitan Water Board</i>)
R. D. Gray, M.D., F.C.Path., D.P.H.	G. U. Houghton, Ph.D., F.R.I.C. (<i>South Essex Waterworks Company</i>)
J. E. Jameson, M.R.C.S.	A. E. Martin, M.D., D.P.H. (<i>Department of Health and Social Security</i>)
J. H. McCoy, M.B., D.P.H.	E. Windle-Taylor, C.B.E., M.A., M.D., F.C.Path., D.P.H. (<i>Metropolitan Water Board</i>)
B. Moore, M.D., B.Sc., F.C.Path., B.A.O.	
R. Pilsworth, M.D., Dip.Bact.	
J. A. Rycroft, M.B., M.C.Path., Dip.Bact.	
A. J. Kingsley Smith, B.M., M.C.Path.	
Miss Joan M. Watkinson, B.Sc.	
R. G. Allen, B.Sc., Ph.D., F.Inst.P. (<i>Water Research Association</i>)	

Joint Public Health Laboratory Service/Animal Health Division Standing Advisory Committee

P.H.L.S. Members

E. S. Anderson, M.D., F.C.Path., Dip.Bact.,
F.R.S.
J. H. McCoy, M.B., D.P.H.
D. J. H. Payne, M.B., F.C.Path., Dip.Bact.

Veterinary Members

W. D. Macrae, M.R.C.V.S., D.V.S.M.
A. B. Patterson, Ph.D., B.Sc., M.R.C.V.S.,
D.V.S.M., F.R.I.C.
A. J. Stevens, M.A., B.V.Sc., M.R.C.V.S.,
Dip.Bact.

Advisory Sub-Committee on Application and Report Forms

Chairman: G. T. Cook, M.D., F.C.Path.

Secretary: R. Pilsworth, M.D., Dip.Bact.

Standing Committee on Laboratory Buildings

Chairman: S. T. Cowan, M.D., D.Sc., F.C.Path., Dip.Bact.

Secretary: R. H. Westlake

Advisory Sub-Committee on Laboratory Supplies

Chairman: Miss Joan R. Davies, M.D., Dip.Bact.

Secretary: A. Waltho

Library Advisory Committee

Joint Chairmen:

B. Moore, M.D., B.Sc., F.C.Path., B.A.O.

Miss Betty H. Whyte, M.A., A.L.A.

Secretary: Miss Betty H. Whyte, M.A., A.L.A.

Standing Committee on Office Equipment and Methods

Chairman: J. H. Hale, O.B.E., M.D., M.C.Path., M.R.C.P.

Secretary: A. Waltho

Standing Committee on Technicians

Chairman: R. J. Henderson, M.D.

Secretary: J. W. Bushell

Working Party on Rubella

Chairman: A. D. Macrae, M.D., M.C.Path., Dip.Bact.

Secretary: D. Reid, M.B., D.P.H.

Mrs. C. M. Patricia Bradstreet, M.B.,
M.C.Path., Dip.Bact.

Miss Suzanne K. R. Clarke, M.D., M.C.Path.

Miss Anne M. Field, Ph.D.

J. H. Hale, O.B.E., M.D., F.C.Path.,
M.R.C.P.

M. H. Hambling, M.D., M.C.Path.,
D.(Obst.) R.C.O.G., Dip.Bact.

D. N. Hutchinson, M.B., Dip.Bact.

W. F. Lane, M.B., M.Sc., F.C.Path., D.P.H.

Miss Christine L. Miller, B.M.

H. D. S. Morgan, M.R.C.S., M.C.Path.,
Dip.Bact.

Mrs. Elise M. Vandeveld, M.B., Dip.Bact.

G. B. B. White, M.R.C.S., M.C.Path.,
Dip.Bact.

J. E. M. Whitehead, M.B., M.C.Path.,
Dip.Bact.

Communicable Disease Report Working Party

Chairman: T. M. Pollock, M.B., M.R.C.P. (Glasg.)

Secretary: Mrs. Enid D. Vernon, B.Sc.

H. R. Cayton, M.B., M.C.Path.
Miss Lynette M. Dowsett, M.D., F.C.Path.
W. B. Fletcher, A.M.R., F.S.S.
M. H. Hughes, D.M., M.C.Path.,
D.T.M.&H., Dip.Bact.
J. C. Kelsey, M.D., F.C.Path., Dip.Bact.
G. J. G. King, M.B., F.C.Path., Dip.Bact.
S. P. Lapage, M.B., M.C.Path., Dip.Bact.
D. L. Miller, M.D., D.P.H.

E. R. Mitchell, M.B., M.C.Path., Dip.Bact.
B. Moore, M.D., B.Sc., F.C.Path., B.A.O.
Professor Scott Thomson, M.D., F.R.C.P.E.,
F.C.Path., D.P.H.
J. O'H. Tobin, B.M., M.C.Path., Dip.Bact.
R. H. Westlake
B. K. Kelly, M.A. (*Medical Research Council
Computer Services Centre*)

Working Party on Epidemic Non-Bacterial Gastro-Enteritis

Chairman: B. Moore, M.D., B.Sc., F.C.Path., B.A.O.

Secretary: Miss Suzanne K. R. Clarke, M.D., M.C.Path.

G. T. Cook, M.D., F.C.Path.
M. H. Hughes, D.M., M.C.Path.,
D.T.M.&H., Dip.Bact.
J. E. Jameson, M.R.C.S.
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D. L. Miller, M.D., D.P.H.
E. R. Mitchell, M.B., M.C.Path., Dip.Bact.

T. D. F. Money, M.B., D.(Obst.)R.C.O.G.
J. O'H. Tobin, B.M., M.C.Path., Dip.Bact.
J. E. M. Whitehead, M.B., M.C.Path.,
Dip.Bact.
D. C. Ower, M.B., D.(Obst.)R.C.O.G.
(*Department of Health and Social Security*)

Working Party on Brucellosis

Chairman: D. J. H. Payne, M.B., F.C.Path., Dip.Bact.

Secretary: J. G. Wallace, B.M., D.C.P., Dip.Bact., M.C.Path.

G. I. Barrow, M.D., M.C.Path., Dip.Bact.
Mrs. C. M. Patricia Bradstreet, M.B.,
M.C.Path., Dip.Bact.
I. D. Farrell, B.Sc.
C. H. L. Howells, B.Sc., M.D., F.C.Path.

T. M. Pollock, M.B., M.R.C.P.(Glasg.)
D. Reid, M.B., D.P.H.
L. Robertson, B.M., M.C.Path., Dip.Bact.
Mrs. Joyce D. Coghlan, B.Sc., Ph.D.
(*University of Edinburgh*)

Working Party on Farmer's Lung

Chairman and Secretary: I. G. Murray, M.B., M.C.Path., D.T.M. & H.

Mrs. C. M. Patricia Bradstreet, M.B.,
M.C.Path., Dip.Bact.
D. G. Davies, M.D., F.C.Path., Dip.Bact.
J. E. Jameson, M.R.C.S.
B. Moore, M.D., B.Sc., F.C.Path., B.A.O.
H. D. S. Morgan, M.R.C.S., M.C.Path.,
Dip.Bact.

M. Sussman, Ph.D., M.I.Biol. (*The Welsh
National School of Medicine, Dept. of
Bacteriology*)
D. M. Weir, M.D. (*Department of Bacterio-
logy, Edinburgh University Medical School*)

Working Parties on Acute Respiratory Virus Infections

(Working in collaboration with the Medical Research Council Working Party)

Group I: Acute Respiratory Virus Infections in General Practice

Chairman: P. G. Higgins, M.D., M.C.Path., Dip.Bact.

Joint Secretaries:

R. E. Hope-Simpson, O.B.E., M.R.C.S.

D. L. Miller, M.D., D.P.H.

Group III: Acute Respiratory Virus Infections among Children in Hospital

Chairman, Laboratory Group: J. O'H. Tobin, B.M., M.C.Path., Dip.Bact.

Chairman, Clinical Group: Professor S. D. M. Court, M.D., F.R.C.P.,
D.C.H. (University of Newcastle)

Secretary: Miss Pauline M. Poole, M.D., M.C.Path., B.A.O., Dip.Bact.

Committee and Working Party on Whooping Cough

Chairman: E. H. Gillespie, M.B., F.C.Path.

Secretary: J. D. Abbott, M.D., M.C.Path., Dip.Bact.

Miss Asne H. Antonis, M.B.
H. R. Cayton, M.B., M.C.Path.
Miss Lynette M. Dowsett, M.D., F.C.Path.
J. V. T. Gostling, M.A., M.B., F.C.Path.,
M.R.C.S.
J. H. Hale, O.B.E., M.D., F.C.Path.,
M.R.C.P.
R. J. Henderson, M.D.
P. G. Higgins, M.D., M.C.Path., Dip.Bact.
H. H. Johnston, D.Phil.
L. A. Little, M.B., F.C.Path., Dip.Bact.
N. S. Mair, M.B., F.C.Path., D.C.H., D.P.H.,
Dip.Bact.
E. R. Mitchell, M.B., M.C.Path., Dip.Bact.
B. Moore, M.D., B.Sc., F.C.Path., B.A.O.
D. J. H. Payne, M.B., F.C.Path., Dip.Bact.
Mrs. Sheila Polakoff, M.B.
T. M. Pollock, M.B., M.R.C.P.(Glasg.)
Miss Pauline M. Poole, M.D., M.C.Path.,
B.A.O., Dip.Bact.
H. G. M. Smith, M.B., Ph.D., Dip.Bact.
Miss Mair E. M. Thomas, M.B., B.Sc.,
F.C.Path., D.P.H.
Professor Scott Thomson, M.D., F.R.C.P.E.,
F.C.Path., D.P.H.
G. C. Turner, M.D., M.C.Path.
J. E. M. Whitehead, M.A., M.B., M.C.Path.,
Dip.Bact.
P. J. Wormald, M.D., M.C.Path.
A. E. Wright, M.D., M.C.Path., D.P.H.,
Dip.Bact.

Professor R. Cruickshank, C.B.E., M.D.,
F.R.C.P., D.P.H. (*Department of Social
and Preventive Medicine, University of the
West Indies, Mona, Kingston 7, Jamaica,
West Indies*)
Professor J. P. Duguid, B.Sc., M.D.,
F.C.Path. (*Bacteriology Department, Uni-
versity of St. Andrews*)
W. N. Dunnet, M.D., D.P.H. (*Department of
Health and Social Security*)
T. F. Elias-Jones, M.B., F.C.Path. (*City
Laboratory, Glasgow*)
R. R. Gillies, M.D., M.C.Path., D.P.H.
(*Bacteriology Department, University of
Edinburgh*)
F. T. Perkins, M.Sc., Ph.D. (*Immunological
Products Control, Medical Research Council*)
N. W. Preston, M.D., M.C.Path., Dip.Bact.
(*Department of Bacteriology and Virology,
University of Manchester*)
A. F. B. Standfast, M.A., D.Sc., Dip.Bact.
(*Vaccine Department, Lister Institute of
Preventive Medicine*)
I. Taylor, M.D., F.R.C.P., D.P.H. (*22 Wales
Avenue, Carshalton, Surrey*)
J. F. Warin, M.D., D.P.H. (*Medical Officer
of Health, City of Oxford*)
A. M. M. Wilson, B.A., B.M., B.Ch.,
Dip.Bact., F.C.Path. (*Bacteriology Depart-
ment, University of Edinburgh*)

Advisory Committee on Viral Reagents

Chairman: Mrs. C. M. Patricia Bradstreet, M.B., M.C.Path., Dip.Bact.

Secretary: Miss E. Margaret Bailey, B.Sc.

Miss Suzanne K. R. Clarke, M.D., M.C.Path.
J. V. T. Gostling, M.A., M.B., F.C.Path.,
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Committee on Infection Risks of Haemodialysis

Chairman and Secretary: B. Moore, M.D., B.Sc., F.C.Path., B.A.O.

Miss Yvonne E. Cossart, M.B., B.Sc.,
M.C.Path., D.C.P.
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D. M. Jones, M.D., Dip.Bact.
J. C. Kelsey, M.D., F.C.Path., Dip.Bact.
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Mrs. Sheila Polakoff, M.B., D.P.H.

G. C. Turner, M.D., M.C.Path.
J. C. Coleman, M.B., M.R.C.S. (*Fulham
Hospital*)
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ment of Health and Social Security*)
R. M. Stirland, M.D., M.C.Path.
(*Manchester Royal Infirmary*)

Working Party on Microbiological Specifications for Food

Chairman: Miss Betty C. Hobbs, O.St.J., D.Sc., F.C.Path., Dip.Bact.

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H. R. Cayton, M.B., M.C.Path.
R. D. Gray, M.D., F.C.Path., D.P.H.
R. W. S. Harvey, B.Sc., M.D., F.C.Path.,
Dip.Bact.
R. J. Henderson, M.D.
W. L. Hooper, B.Sc., M.B., M.C.Path.,
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H. H. Johnston, D.Phil.
J. H. McCoy, M.B., D.P.H.

P. G. Mann, M.D., M.C.Path., Dip.Bact.
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Miss Mair E. M. Thomas, M.B., B.Sc.,
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Secretary: D. C. J. Bassett, M.B., Dip.Bact.

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H. R. Cayton, M.B., M.C.Path.
J. V. Dadswell, M.B., M.C.Path.
C. Dulake, M.B., M.C.Path., Dip.Bact.
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D.T.M.&H., Dip.Bact.
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M.C.Path.
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School, Bristol*)

Working Party on the Contamination of Pharmaceutical Products

Chairman: Mrs. Joan Taylor, M.B., B.Sc., F.C.Path., D.P.H.

Secretary: W. L. Hooper, B.Sc., M.B., M.C.Path., Dip.Bact.

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| B. W. Barton, M.B., M.C.Path., Dip.Bact. | M. G. Leakey, M.P.S. (<i>Group Pharmacist, Torbay Hospital, Torquay</i>) |
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| E. R. Mitchell, M.B., M.C.Path., Dip.Bact. | G. Sykes, M.Sc., Hon.M.P.S., F.R.I.C., F.I.Biol. (<i>Boots Pure Drug Co., Ltd., Nottingham</i>) |
| B. Moore, M.D., B.Sc., F.C.Path., B.A.O. | D. L. Thomas, B.Sc., M.P.S., D.B.A. (<i>Group Pharmacist, Derbyshire Royal Infirmary, Derby</i>) |
| M. T. Parker, M.D., F.C.Path., Dip.Bact. | |
| Miss Pauline M. Poole, M.D., M.C.Path., B.A.O., Dip.Bact. | |
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Working Party on the Hygiene and Marketing of Fresh Cream

Chairman: R. J. Henderson, M.D.

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| J. V. Dadswell, M.B., M.C.Path. | G. H. Tee, M.R.C.S., Ph.D., F.C.Path. |
| D. G. Davies, M.D., F.C.Path., Dip.Bact. | Miss Joan M. Watkinson, B.Sc. |
| H. C. Dawkins, F.I.M.L.T. | P. J. Wormald, M.D., M.C.Path. |
| E. H. Gillespie, M.B., F.C.Path. | W. Shepherd, M.D., M.C.Path. (<i>Bacteriology Laboratory, Belfast City Hospital</i>) |
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APPENDIX II

PUBLICATIONS BY MEMBERS OF THE STAFF OF THE PUBLIC HEALTH LABORATORY SERVICE DURING 1968

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APPENDIX III

AWARDS AND EXTERNAL OFFICES ACCEPTED BY MEMBERS OF THE SERVICE DURING 1968

Dr. R. M. Shaw	..	..	C.B. in Birthday Honours List.
Dr. G. I. Watson	..	..	O.B.E. in Birthday Honours List.
Sir James Howie	..	..	Elected President of the British Medical Association for the year 1969-70.
Dr. E. S. Anderson	..	..	Elected a Fellow of the Royal Society.
Mr. L. R. Hill	..	..	Member of the Editorial Board, Journal of General Microbiology.
Dr. J. G. P. Hutchison	..	..	Member of the Regional Advisory Committee on Infectious Diseases (Birmingham Regional Hospital Board); Seconded as Lecturer in Microbiology, University College, Salisbury, Rhodesia, for month of May 1968.
Dr. J. C. Kelsey	..	..	Member of the Council of the Association of Clinical Pathologists; Erasmus Wilson Demonstratorship, Royal College of Surgeons of England.
Dr. D. M. Jones	..	..	Honorary Lecturer in Pathology, University of Manchester.
Dr. S. P. Lapage	..	..	Part-time Lecturer, Department of Bacteriology and Immunology, London School of Hygiene and Tropical Medicine; Recognized Teacher in the University of London.
Dr. J. H. McCoy	..	..	Member of the World Health Organization Expert Advisory Panel on Food Hygiene.
Dr. Hélène J. Mair	..	..	Honorary Consultant Virologist, Leicester Group of Hospitals.
Dr. J. Marks	..	..	Member of International Committee for Nomenclature of Bacteria; Member of Sub-Committee on Mycobacteria.
Dr. D. L. Miller	..	..	United Kingdom delegate to meeting of <i>ad hoc</i> Working Group on Communicable Diseases, Sub-Committee on Health of the Central Treaty Organization, Ankara, Turkey, February 1968.
Dr. B. Moore	..	..	Secretary, Pathological Society of Great Britain and Ireland.
Dr. I. G. Murray	..	..	World Health Organisation Consultant in Medical Mycology; General Secretary, International Society of Human and Animal Mycology; Animal House and Winches Farm Committee, and Tropical Studies Committee, London School of Hygiene and Tropical Medicine.
Dr. M. T. Parker	..	..	Assistant Editor, Journal of Medical Microbiology; Member of Council, Research Defence Society.
Dr. D. J. H. Payne	..	..	Examiner for the College of Pathologists; Member of the Microbiological Committee of the Association of Clinical Pathologists.

- Dr. T. M. Pollock Member of the B.C.G. Vaccination Sub-Committee of the Central and Scottish Health Services Council Joint Committee on Vaccination and Immunisation; Member of the Infectious Diseases Sub-Committee of the British Medical Association Public Health Committee; Vice-President, Society of Medical Officers of Health Research Group Advisory Council.
- Mr. R. A. Quaife Member of the Advisory Panel on Bacteriology, Institute of Medical Laboratory Technology.
- Dr. C. E. D. Taylor Member of the Association of Clinical Pathologists Post-graduate Studies Board; Member of the Association of Clinical Pathologists Education Committee.
- Dr. Joan Taylor Honorary Member of the Society for Applied Bacteriology; President of the Epidemiology and Preventive Medicine Section, Royal Society of Medicine; Examiner in Bacteriology, University of Birmingham.
- Professor Scott Thomson Chairman of the Division of Pathology, United Cardiff Hospitals.
- Dr. J. O'H. Tobin Co-opted Member of the Medical Research Council's Rubella Vaccine Committee; Member of the Institute of Medical Laboratory Technology Examining Body.

INDEX TO PERSONAL NAMES

- Abbott, J. D., 27, 43, 47, 50
 Achong, B. G., 53
 Adams, F.A., iii
 Adams, Mary O., 34
 Ajmal, M., 53
 Allen, R. G., 47
 Anderson, D. M., 53
 Anderson, E. S., 8, 33, 38, 39, 47, 53, 58, 63
 Anderson, J. P., 53
 Andrews, B. E., 8, 33, 40, 53
 Antonis, Asne H., 29, 50
 Archer, J. F., 53, 60
 Archetti, I., 18
 Armstrong, Elizabeth C., 26
 Arneaud, J. D., 58
 Artenstein, M. S., 20
 Arthur, Beryl J., 29
 Asheshov, Elizabeth A. Hall, 9, 33, 53
 Ashton, C. I., 26
 Atkinson, Dawn, 26

 Babudieri, B., 10
 Bailey, E. Margaret, 35, 50
 Baillie, Margery B., 26
 Barnard, A. F., 32
 Barrow, G. I., 32, 47, 49, 51, 52, 53, 54, 56
 Barton, B. W., 28, 52, 54
 Bascomb, S., 57
 Bassett, D. C. J., 8, 33, 51, 58
 Bettelheim, K. A., 54, 56, 59
 Blake, Jean M., 34
 Blowers, R., 6, 8, 30
 Boissard, Joan M., 26, 42, 51
 Bound, W. H., 30
 Boyd, J. F., 54
 Blaikie, W. B., 58
 Bradstreet, C. M. Patricia, 8, 18, 35, 40, 48, 49, 50, 54, 60
 Breckon, D., 28
 Brewer, J. E., 56
 Bridgwater, F. A. J., 36, 53
 Brighton, W. D., 54
 Brightwell, S., 47
 Brock, Brenda M., 33
 Brookes, W. T., 52
 Brooks, R., 32
 Brooksbank, N. H., 13, 58
 Brown, G. L., 54
 Brown, R. N., 31
 Bryant, R. C., ii, iii
 Buckley, H. R., 58
 Buescher, E. L., 20
 Bullen, Catherine L., 30
 Bullin, C. H., 28
 Bunting, F. W., 47
 Burman, N. P., 47
 Burt, R., 30
 Bushell, J. W., v, 25, 48
 Buxton, M. W. D., 31

 Canaperia, G. A., 10
 Cannon, F. N., 30
 Caravano, R., 54, 58
 Carpenter, K. Patricia, 8, 21, 33, 38, 47, 54
 Cartwright, R. Y., 29
 Cavanagh, P., 32
 Cayton, H. R., 26, 42, 43, 49, 50, 51
 Chakraverty, Patricia, 34, 59
 Chamberlain, G., 54
 Chandar, K., 54
 Charter, R. E., 13
 Chessum, B. S., 30, 54
 Christie, D. R., 29
 Churcher, Gillian M., 31, 54
 Citron, K. M., 54
 Clark, R., 29
 Clarke, Suzanne K. R., 26, 38, 48, 49, 50
 Cockburn, W. C., 20
 Codd, A. A., 27, 54, 56
 Coetzee, E. F. C., 28
 Coghlan, Joyce D., 49, 56
 Coleman, J. C., 51
 Coles, H. G., 27
 Collins, C. H., 29, 43
 Colwell, D. C., 54
 Conchie, A. F., 54
 Cook, G. T., 29, 48, 49, 52
 Coombes, R. R. A., 57
 Cossart, Yvonne E., 34, 41, 51, 54
 Court, S. D. M., 50
 Cowan, S. T., 48, 60
 Cowburn, G. R., 58
 Cracknell, V. M., 13
 Cradock-Watson, J. E., 8, 27
 Craske, J., 34
 Croll, J. M., 29, 52
 Crone, P. B., 32, 47
 Cruickshank, R., 50
 Cunliffe, A. C., iii
 Curtis, M. A., 34

 Dadswell, J. V., 31, 51, 52
 Darling, W. M., 27
 Davies, D. G., 16, 28, 39, 49, 52
 Davies, G., 28
 Davies, Heather, 33
 Davies, J. B. Meredith, iii
 Davies, Joan R., 7, 29, 37, 48, 54
 Dawkins, H. C., 31, 52
 D'Costa, J. F., 55
 Denton, G., 32
 de Sa, J. D. H., 33
 Dewar, H. A., 57
 Diamond, Judith R., 34
 Dick, A. G., 32
 Dighero, Mabel W., 35
 Dillon, H. C., 55
 Donovan, T. J., 30
 Douglas, R. D., 18

- Dowsett, Lynette M., 30, 49, 50
 Driver, A. A., iii
 Dubes, G. R., 18
 Dudgeon, J. A., 20
 Duguid, J. P., 50
 Dulake, C., 29, 51, 54
 Dunlop, E. M. C., 55, 60
 Dunnet, W. N., 50
 Durge, N. G., 58
 Durrant, A. H., 29
 Dyke, K. G. H., 53
 Dyke, S. C., 56, 57
- Earnshaw, Carol A., 26
 Eaton, B. R., 32, 52
 Ebling, F. J. G., 58
 Edel, W., 61
 Edwards, Joan M. B., 35
 Elias-Jones, T. F., 37, 50, 55
 Elliott, D. H., 55
 Ellis, C., 32
 Ellis, Gillian J., 35
 Ellis, Vivienne E., 35
 Emberley, N. W., 28
 Emerson, P. A., 54
 Emslie, J. A. N., 7
 Engelbrecht, F. M., 8
 Enticknap, J. B., 55
 Erwa, H. H., 55
 Essex-Cater, A. J., ii, iii
 Evans, A. D., 26, 41, 42, 55
 Everall, P. H., 31
 Everard, R. A., 31
 Everest, E., 30
- Fairrie, D. V. T., 7, 21
 Farrant, W. N., 54
 Farrell, I. D., 31, 49, 55, 56, 59
 Feizi, T., 60
 Fell, H. W. K., 26
 Fenlon, D. R., 35
 Fennell, H., 32
 Ferguson, H. G., 60
 Field, Anne M., 8, 34, 48, 55
 Fisher, P. J., 35
 Fitt, Margaret, 30
 Fleck, D. G., 8, 30, 43
 Fletcher, W. B., 7, 34, 49, 51
 Flewett, T. H., 36
 Flynn, F. J., 33
 Foord, N., 33
 Foreman, J., 35
 Fox, E., 29
 France, Diana R., 33
 Fraser, C. A. M., 57
 Fraser, P. K., 29, 55
 Fredette, V., 56
 Fretwell, G., 57, 59
 Furniss, A. L., 8, 21, 30, 47
- Galbraith, N. S., 55
 Gamble, D. R., 28, 38, 55
 Gardner, Sylvia D., 34, 38, 55
 Garnham, P. C. C., 40
 Gell, P. G. H., 57
 Ghosh, A. C., 35, 55
 Gibbs, B. M., 54, 56
 Gilbert, R. J., 35, 55, 56
 Gillespie, E. H., 27, 50, 51, 52
 Gillies, R. R., 50
- Gilmour, Anne H., 33
 Glencross, E. J. G., 31
 Goodwin, C. S., 8, 31, 55
 Gordon, J. F., 54
 Gostling, J. V. T., 31, 50
 Gould, J. C., 51
 Graham, J. M., 31, 57
 Graham-Jones, O., 54, 55, 56, 57, 58, 59, 60
 Grant, Doris L., 33
 Grant, Helen G. T., 30
 Graves, Bessie H. E. Cadness, 8
 Graves, P. A., 26
 Gray, R. D., 30, 47, 51
 Greaves, J. L., 56
 Greasby, A. S., 31
 Greatorex, F. B., 32
 Griffiths, Jane M. W., 33
 Griffiths, P. W. W., 28
 Grindley, N. D. F., 33
 Gross, R. J., 34
 Guthe, T., 55
- Hadgraft, J. W., 52
 Hale, J. H., 9, 27, 42, 44, 48, 50, 54, 56
 Hall, J. A., 27
 Hall, Mary L. M., 34
 Hambling, M. H., 26, 38, 42, 48, 59
 Hamilton, J. P., 18
 Hammon, W. McD., 20
 Harnett, G. B., 55
 Harper, I. A., 32, 55
 Harper, R., 26
 Harris, C. R., 29
 Hart, J. M., 54
 Hart, R. J. C., 29, 55, 60
 Harvey, R. W. S., 6, 16, 26, 47, 51, 55
 Hatfield, J., 54
 Haughton, L. J., 32
 Hawkins, G. T., 20
 Heaf, F. R. G., 57
 Hedges, A. J., 59
 Heimer, G. V., 59
 Helsdon, H. L., 58
 Henderson, R. J., 32, 41, 48, 50, 51, 52, 56
 Hers, J. F. P., 9
 Hewish, R. A., 33
 Hewitt, J. H., 33, 55, 57
 Higgins, P. G., 5, 35, 50, 55
 Hill, L. R., 9, 35, 56, 57, 63
 Hingston, C. W. J., 53
 Hobbs, Betty C., 6, 9, 35, 38, 39, 47, 51, 52, 56, 59, 60
 Hooper, W. L., 7, 9, 36, 51, 52, 54, 55
 Hope-Simpson, R. E., 35, 50
 Hopps, H. E., 18
 Horsfall, Eleanor E., 33
 Houghton, G. U., 47
 Howells, C. H. L., 32, 36, 49
 Howes, Jacqueline A., 33
 Howie, Sir James W., ii, v, 8, 9, 21, 25, 56, 63
 Hoyle, L., 8, 9, 30, 40, 60
 Hughes, Alison R., 33
 Hughes, M. H., 32, 49, 51, 56
 Hutchinson, D. N., 36, 48, 53
 Hutchison, J. G. P., 9, 27, 51, 52, 56, 63
- Ingham, H. R., 54, 56, 57
 Inglis, J. M., 53
 Ingram, M., 47

- Ivey, Barbara R., 32
 Ivory-Hollingsworth, W. R., 26
- Jackson, R. V., v, 25
 Jacobs, S. I., 36
 James, A. M., 56
 James, Ruth, C. J., 30, 52
 Jameson, J. E., 28, 39, 47, 49, 56
 Jeanes, A. L., 37
 Jebb, W. H. H., 9, 27, 38, 42, 47, 51
 Jellard, C. H., 7
 Jenkins, H. R., 32
 Jenkins, P. A., 34, 57
 Jephcott, A. E., 27
 Jevons, M. Patricia, 36
 Johnson, D. L., 53
 Johnston, H. H., 27, 50, 51
 Johnston, Nafra A., 34, 56
 Johnstone, G. F., 28
 Jones, A. C., 31
 Jones, B. R., 55, 60
 Jones, C. M., 53
 Jones, D. M., 8, 27, 51, 56, 58, 63
 Jones, Janet Wynn, 32
 Joyce, C. R. B., 54
- Kamitsuka, P., 18
 Kampelmacher, E. H., 9, 61
 Kelemen, M. V., 53
 Kelly, B. K., 49
 Kelsey, J. C., v, 25, 33, 38, 47, 49, 51, 56, 63
 Kendall, Margaret, 35, 56
 Kerr, W. R., 56
 Kershaw, J. W., 59
 Keymer, I. F., 57
 Kidd, E., 54
 King, A. J., 60
 King, G. J. G., 31, 49
 Kingston, D., 57
 Kitchen, V. G., 32
 Knowles, Wendy A., 34
 Knox, J. D. E., 57
 Knox, R., iii
 Kohn, J., 57
 Kwantes, W., 32, 43, 47
- Lane, W. F., 27, 48
 Lansdowne, D. T., 29
 Lanyi, B., 9
 Lapage, S. P., 6, 9, 34, 35, 49, 57, 63
 Lasheen, Ragaa, M., 26
 Laubersheimer, G. V., 9, 29
 Laurence, B. R., 39
 Leach, R. H., 8, 33
 Leakey, M. G., 52
 Leat, J. L., 34
 Lee, J. A., 34
 Le Minor, L., 57
 Lenahan, M., 18
 Lewis, M. J., 31, 57
 Lidwell, O. M., 33, 41, 57, 60
 Little, L. A., 32, 43, 47, 50
 Lloyd, Monica, 27
 Lloydbottom, H. L., 25
 Longbottom, Joan L., 57
 Lowe, G. H., 30
 Lowry, D. M. O., 13, 59
 Ludlam, G. B., 26, 43, 51
 Lumsden, W. H. R., 41
- Macauley, Margaret E., 27, 35
 MacCallum, F. O., 60
 McCarthy, K., iii, 42
 McCaughey, W. J., 56
 McCollum, J. P. K., 57
 McCoy, J. H., 29, 47, 51, 63
 McDonald, J. C., 20, 59
 McDonald, J. R., 34, 60
 McGimpsey, G., 34
 McGregor, J. R., ii
 McLintock, J. S., 60
 Macnair, D. R., 57
 Macrae, A. D., 9, 34, 41, 42, 48, 49, 50, 57
 Macrae, W. D., 47
 McSwiggan, D. A., 29, 57
 Mahgoub, E. S., 58
 Mair, Hélène J., 29, 54, 63
 Mair, N. S., 29, 41, 50, 54, 57
 Mann, P. G., 27, 51, 52
 Marks, J., 34, 43, 57, 58, 63
 Marshall, J., 27
 Marshall, W. C., 20
 Martin, A. E., 47
 Martin, T. D. M., 36
 Mason, J., 56
 Maurer, Isobel M., 33, 55, 58
 Maxted, W. R., 8, 33, 54, 55, 58
 May, J. R., 54
 Maybury, P., 28
 Mayhew, June N., 33, 53
 Meers, P. D., 31
 Melnick, J. L., 18
 Meurisse, Eleanor V., 34, 53
 Meyer, H. M., 18
 Milch, H., 9
 Miller, Christine L., 34, 48
 Miller, D. C., 53
 Miller, D. L., 9, 34, 49, 50, 51, 58, 63
 Mills, J. C. K., 32
 Mitchell, E. R., 31, 49, 50, 52
 Mitchell, N. J., 29, 35
 Money, T. D. F., 30, 49
 Moore, B., iii, 29, 39, 47, 48, 49, 50, 51, 52, 63
 Moore, J. M., 36
 Morgan, H. D. S., 28, 39, 47, 48, 49, 58
 Morris, C. A., 26, 58
 Moss, P. D., 58
 Mulcahy, D., 59
 Murray, I. G., 5, 9, 33, 39, 40, 49, 51, 57, 58, 63
- Nagington, J., 26, 58
 Naylor, G. R. E., 26, 51, 58
 Nelson, G. S., 40, 43
 Newell, K. W., 58
 Norton, R., 8
- Odrzywolski, W., 26
 O'Grady, F. W., 59
 Okubadejo, O. A., 31
 Owen, R. J., 35
 Ower, D. C., 49, 51
- Parker, L., 58
 Parker, M. T., iii, 25, 33, 41, 42, 47, 51, 52, 55, 58, 63
 Parkman, P. D., 18, 20
 Parry, W. H., 59
 Patton, J. B., 32

- Patterson, A. B., 47
 Patterson, P. J., 34
 Payne, D. J. H., 10, 31, 37, 47, 49, 50, 56, 58, 63
 Payne, Jacqueline, 33
 Peacock, A., 27
 Pead, P. J., 55
 Pearson, R. C. M., 57
 Peckham, C. S., 20
 Peel, M., 27, 54
 Pennington, J. H., 13, 58
 Pepys, J., 57
 Pereira, Marguerite S., 34, 40, 58, 59
 Perkins, F. T., 50
 Pether, J. V. S., 32, 59
 Phillips, K. D., 35
 Philpot, Christine M., 33
 Pilsworth, R., 28, 47, 48, 59
 Pinney, Alison M., 33
 Pitton, J. S., 53
 Plows, C. D., 27, 59
 Polakoff, Sheila, 34, 50, 51
 Pollock, T. M., 10, 34, 47, 49, 50, 59, 64
 Poole, Pauline M., 13, 28, 50, 52, 58
 Porter, R., 58
 Porterfield, J. S., 37
 Potter, C. W., 60
 Preston, N. W., 50
 Price, T. H., 26, 55

 Quaife, R. A., 31, 56, 59, 64

 Ratcliffe, Hazel, 34
 Rayner, Catherine F. A., 59
 Reed, R. J., 33
 Reeve, J. D., 57
 Reeves, M. S., 55
 Reid, D., 8, 48, 49, 54, 57
 Rice, N. S. C., 60
 Rich, G. E., 27
 Ridealgh, D., 57
 Ridley, D. S., 41
 Roberts, Diane, 35
 Roberts, J. G., 52
 Robertson, L., 31, 49, 51, 55, 56, 58, 59
 Robertson, W. J., 25
 Rogers, F. G., 34
 Rogers, K. B., 13
 Rohde, R., 57
 Rolfe, V. C. T., 26
 Rook, A., 58
 Ross, Helen G., 30
 Rowe, B., 34
 Roylance, Alison F., 26
 Rusby, N. L., 57
 Ryan, W. J., 29, 59
 Rycroft, J. A., 32, 47

 Salter, P. A., 53
 Sandys, G. H., 27
 Scheuer, P. J., 60
 Schild, G. C., 60
 Scrimgeour, G., 34
 Scrutton, M. W., 28
 Selkon, J. B., 27, 43, 54, 56, 59
 Semple, A. B., 13, 59
 Sequeira, P. J. L., 44
 Seth, A. D., 34
 Severn, M., 27
 Seymour, F., 13, 58

 Shannon, R., 26, 59
 Shapton, D. A., 54, 56
 Shaw, R. M., iii, 63
 Shepherd, W., 52
 Shooter, R. A., 59
 Simkovicova, Magda, 35
 Simmons, L. E., 27
 Sivell, C. W., 30
 Skan, D. A., 31
 Skirrow, M. B., 32
 Smith, A. J., 29
 Smith, A. J. Kingsley, 28, 47, 51, 52
 Smith, H. G. M., 27, 37, 47, 50, 51
 Smith, H. R., 33
 Sommerville, R. G., 60
 Somner, A. R., 54
 Spain, G. E., 29
 Speers, R., 33
 Spence, G., 29
 Spence, K., 30
 Spencer, A. G., 59
 Spencer, B., 27
 Spooner, E. T. C., iii
 Spriggs, E. A., 54
 Stanbridge, T. N., 35
 Standfast, A. F. B., 50
 Stern, H., 38
 Stevens, A. J., 47
 Stevens, C. C., iii
 Stevenson, J., 59
 Stewart, A. E., 55
 Stewart, G. L., 18
 Stirland, R. M., 51
 Storey, C. J., 34
 Suckling, W. G., 31
 Sussman, M., 39, 49
 Sutcliffe, W. A., 27
 Sutton, R. G. A., 56, 59
 Sykes, G., 52
 Szulga, T., 57

 Tannahill, Agnes J., 35, 40
 Tanner, Elizabeth I., 7, 28, 55
 Talbot, J. M., 36
 Taylor, C. A., 58
 Taylor, C. E. D., 7, 29, 40, 58, 59, 64
 Taylor, Hilda, 32
 Taylor, I., 50
 Taylor, Joan, 10, 34, 37, 39, 41, 47, 52, 54, 57, 58, 59, 64
 Tee, G. H., 28, 52
 Thillainathan, P., 29
 Thom, B. T., 7, 30, 51
 Thomas, D. L., 52
 Thomas, K. L., 28
 Thomas, Mair E. M., 34, 50, 51
 Thomas, W. R. G., 36
 Thompson, R. G., 27
 Thomson, Scott, 26, 42, 49, 50, 64
 Tinkler, A. E., 59
 Tobin, Barbara, 56
 Tobin, J. O'H., 6, 8, 27, 38, 49, 50, 54, 59, 60, 64
 Tomlinson, A. H., 27, 59, 60
 Tomlinson, A. J. H., 7, 54, 55
 Tooth, J. A., 31
 Towers, Adeline G., 33
 Trelfall, E. J., 33
 Trevains, Phillipa H., 32
 Tucker, R. G., 27

- Turk, D. C., 36
 Turner, G. C., 13, 26, 43, 50, 51, 58, 59
 Turner, L. H., 10, 33, 40, 60
 Tyldesley, R. C., 51

 Uttley, Anne, H. C., 29

 Vandavelde, Elise M., 34, 48
 Vaughn, J. B., 58
 Vernon, Enid D., 34, 49

 Walker, Georgina H., 27
 Walker, J. H. C., 16
 Wallace, J. G., 7, 30, 49, 51
 Waltho, A., v, 25, 48
 Warin, J. F., iii, 50
 Watkinson, Joan M., 27, 47, 52
 Watson, G. I., iii, 63
 Weir, D. M., 39, 49
 Wenner, H. A., 18
 Westlake, R. H., v, 25, 48, 49
 White, A. B., 33
 White, G. B. B., 26, 48, 50
 White, J. E., 57
 Whitehead, J. E. M., 28, 48, 49, 50
 Whittaker, J. D., iii, v, 7, 21, 25
 Whyte, B. H., 25, 48

 Wicks, G., 54
 Widdowson, Jean P., 33
 Wildy, N. P. L., iii, 42
 Wilkinson, A. E., 34, 44, 55, 56, 60
 Wilkinson, D. S., 58
 Willcox, W. R., 34
 Williams, L. P., 58
 Williams, R. E. O., 60
 Willis, A. T., 30, 37, 51
 Wilson, A. M. M., 50
 Wilson, Margaret A. M., 27
 Wilson, Sylvia R., 30
 Winchester, J. S., 26
 Windle-Taylor, E., 47
 Wiseman, R., 30, 35
 Wolstenholme, G. E. W., 58
 Wood, P. C., 56, 57
 Woodgate, D. J., 60
 Woodruff, A. W., 60
 Woods, Jennifer M., 33
 Woolley, D. A., 35
 Wormald, P. J., 31, 50, 51, 52
 Wright, Sir Almroth E., 16
 Wright, A. E., 29, 47, 50, 51, 52, 56
 Wyon, D. P., 57, 60

 Young, E. C., 31

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